

Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

ed States
artment of
ulture

omic
arch
ervice

Agriculture
and Trade
Analysis
Division

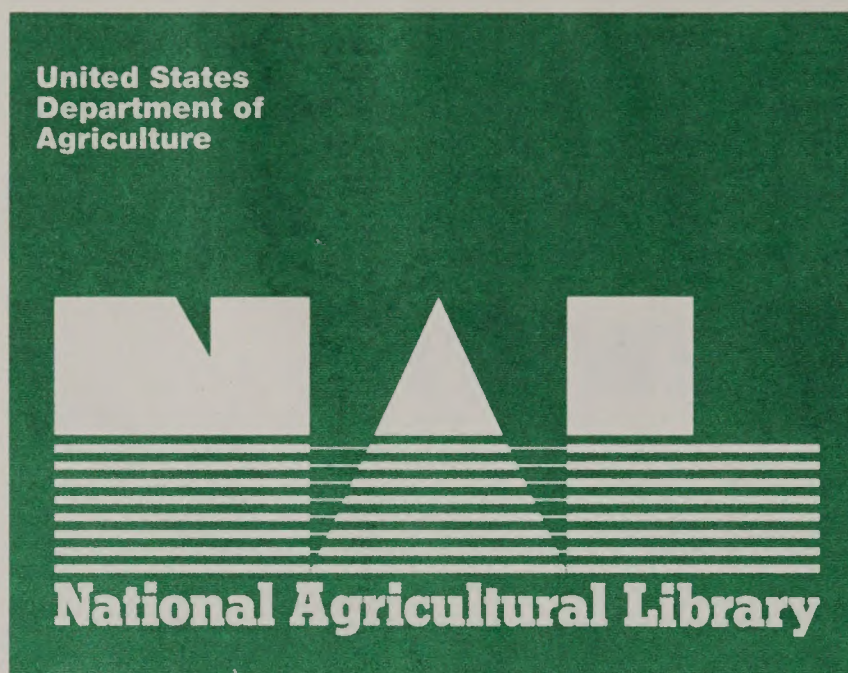
Overview of the Static World Policy Simulation (SWOPSIM) Modeling Framework

Vernon Roningen
Praveen Dixit
John Sullivan
Tracy Hart

U.S. DEPARTMENT OF AGRICULTURE
NATIONAL AGRICULTURAL LIBRARY
AUG 22 1997

CATALOGING PREP.

FILE COPY



It's Easy To Order Another Copy!

Just dial 1-800-999-6779. Toll free in the United States and Canada. Other areas, please call 1-301-725-7937.

Ask for *Overview of the Static World Policy Simulation (SWOPSIM) Modeling Framework* (AGES 9114).

The cost is \$8.00 per copy. For non-U.S. addresses (includes Canada), add 25 percent. Charge your purchase to your VISA or MasterCard, or we can bill you. Or send a check or purchase order (made payable to ERS-NASS) to:

ERS-NASS
P.O. Box 1608
Rockville, MD 20849-1608.

We'll fill your order by first-class mail.

Overview of the Static World Policy Simulation (SWOPSIM) Modeling Framework. By Vernon Roningen, Praveen Dixit, John Sullivan, and Tracy Hart. Agriculture and Trade Analysis Division, Economic Research Service, U.S. Department of Agriculture. Staff Report No. AGES 9114.

Abstract

This document provides a brief overview of the SWOPSIM modeling framework for a potential user. Source documents for topics are cited and an example of model construction is presented.

Keywords: trade model, simulation model, SWOPSIM.

Acknowledgments

Thanks to Bill Kost and Jerry Sharples for reviewing the manuscript and to Bonnie Moore for editorial assistance.

Disclaimer: Use of trademarks in this publication is for identification only and does not constitute endorsement by the U.S. Department of Agriculture.

Contents

Introduction	1
History	1
Characteristics of Models Created by the SWOPSIM Framework .	2
The Economics of SWOPSIM Models	4
Data Requirements for SWOPSIM Models	6
Computer Hardware and Software Requirements	7
Building the World Model DEMO With the SWOPSIM Framework ...	9
Operations in the SWOPSIM Framework	9
Making a Model Subdirectory	11
Establishing a Master Model File	11
Constructing Country Base Quantity Data Spreadsheets ..	13
Creating Policy Support Spreadsheets	14
Constructing a Country Spreadsheet	16
Generating a Multi-Commodity World Model	20
Simulating a World Model	21
Producing SWOPSIM Output	23
Concluding Comments	25
Conducting Sensitivity Analyses	25
Modifications to the Default Model	26
References	27
Appendix A--Country Policy Support Spreadsheet--DEMOSUS	34
Appendix B--Country Model Spreadsheet--DEMOBUS	38
Country Base Data Spreadsheet--DEMOTUS	40
Appendix C--Output Examples--EOUT, BOUT, SOUT	41
Appendix D--SWOPSIM Country Model Variable List	46

Overview of the Static World Policy Simulation (SWOPSIM) Modeling Framework

Vernon Roningen, Praveen Dixit,
John Sullivan, and Tracy Hart

Introduction

This manual helps potential users understand the basic features of the Static World Policy Simulation (SWOPSIM) modeling framework and evaluate its suitability for their problems. As topics are discussed, publications giving more detail are referenced. A brief history of SWOPSIM is provided, followed by a discussion of the characteristics of the models created by the framework. The economics of a typical model and its data requirements are outlined. The overview concludes with an illustrated example using the SWOPSIM framework to construct and utilize a demonstration model.

History

Work on the SWOPSIM modeling framework started in the summer of 1985 when the Economic Research Service (ERS) wanted to address three specific issues: (1) how levels of assistance to agriculture compare across countries and commodities; (2) how assistance to agriculture in industrial market economies has distorted world production and trade, and (3) what economic impact resulted from removing assistance to agriculture in industrial market economies.

ERS initial estimates of the levels of assistance to agriculture across commodities and countries were published in 1987 (73).¹ Using a methodology developed by the Organization for Economic Cooperation and Development (OECD), ERS calculated producer and consumer subsidy equivalents (PSEs and CSEs) for agriculture for a number of commodities and countries (55). Since then, there have been two follow-ups to the original ERS report. The latest ERS publication (72) provides estimates of agricultural support for 28 countries, including several developing and centrally planned countries.

Summary measures of protection such as the PSEs and CSEs are indicators of the support to agriculture but do not incorporate potential supply and demand responses to changes in support levels. They do not account for offsetting policies such as

¹Underscored numbers in parentheses refer to items cited in the References at the end of this report.

supply controls which might accompany other support measures. Therefore PSEs and CSEs may have little to say, by themselves, about the distortionary implications of support policies or the consequences of support on commonly used indicators of economic performance.

If support changes are expected to have consequences for world markets, a global agricultural trade model is needed to adequately address the issue. ERS undertook to build such a model and the SWOPSIM framework evolved as the construction tool. The OECD (55) and Tyers and Anderson (71) were in the process of completing global models for the analysis of support and ERS was able to observe and draw on these experiences in constructing its own system. One of the first informal tests of the SWOPSIM system after its initial construction was its use to emulate the OECD and Tyers and Anderson's model, using their parameters and data to duplicate their results.

The initial version of the SWOPSIM framework was completed in 1986 (57). How Level is the Playing Field?: An Economic Analysis of Agricultural Policy Reform in Industrial Market Economies (62) represents the principal study that used SWOPSIM and ERS agricultural support information to evaluate the consequences of agricultural protection on a global basis. This study shows the full power of a comprehensive global data set and model in illustrating whose support distorts world agricultural trade. Several other studies used the framework to build models for various purposes. The references cited include most studies to date that have used a version of the SWOPSIM framework as a research tool.

Like any research tool, the SWOPSIM framework has undergone a number of changes since 1986. Some of these changes reflect modifications required to address ongoing issues or improve particular model specification. Others take advantage of improvements in both the hardware and software that are used to run the framework. The current operating version of the SWOPSIM framework is discussed in this overview publication along with an example from a current demonstration model. Revised documentation of the current version is forthcoming (58).

Characteristics of Models Created by the SWOPSIM Framework

SWOPSIM is a modeling framework, not a model in itself. It is a software package that can be used to build various types of simple standard global models linked by trade. All models created by the SWOPSIM framework have certain characteristics (57, 58).

Static: SWOPSIM models are static. They calculate the implications of policy reform or other economic shocks after full adjustment, but will not give the time path of adjustment. SWOPSIM models can be used for counterfactual analysis and for static projections.

Nonspatial: SWOPSIM models provide information on the net trade flows of a country or region but do not normally provide trade flows among countries. In other words, importers do not distinguish commodities by source of origin, and domestic and traded goods are assumed to be perfect substitutes in consumption.

Multi-product, multi-region: The SWOPSIM framework can build multi-product, multi-country models to a maximum of 60-70 products and 38 regions.² The actual size of a model is governed by data availability and computer hardware restrictions. The dataset used for most SWOPSIM models at ERS has 22 products, covering the grain-oilseeds-livestock complex for up to 36 countries/regions of the world (69).

Partial equilibrium: SWOPSIM models normally examine relationships within a sector (e.g. agriculture), not resource shifts between sectors (e.g. agriculture versus nonagriculture). Factor prices and other general equilibrium conditions are assumed to be fixed.

Synthetic: SWOPSIM model parameters (elasticities and technical coefficients) are not estimated with the SWOPSIM framework; rather, they are obtained from the literature (12) or can be estimated econometrically. However, theoretically valid behavioral relationships can be imposed on the supply and demand elasticities actually used. These relationships contribute to theoretical purity of the system and, from a practical solution viewpoint, encourage model stability.

Policy-oriented: SWOPSIM models are designed to analyze the economic implications of policy changes that can have a global impact. They are more suited to study total liberalization of all policies, though they can be used for partial reform as well.

A policy is usually represented in SWOPSIM models by a fixed price wedge: a wedge between the traded price and the domestic incentive price. The policy price wedge data are obtained from ERS calculations of producer and consumer subsidy equivalents (72,73) where a wide range of support policies were translated into a common measure. Policies can also be implicitly introduced into SWOPSIM models through price transmission parameters that regulate the transmission of world price changes to the domestic economy, and by shifting supply equations to capture production control policies.

Spreadsheet based: Data, parameters, and solution output from SWOPSIM models are maintained in spreadsheets on personal computers (PCs). This requires a potential SWOPSIM user to know

²The framework can construct a single commodity global model from a dataset. Also, multi-product, multi-country models can be assembled ceteris paribus, holding values for selected products or countries constant.

spreadsheet technology and have an understanding of the PC Disk Operating System (DOS).

The SWOPSIM framework consists of computer programs which perform repetitive operations on data and a standardized model maintained in spreadsheets. The programs write and run spreadsheet macro commands which, in turn, carry out spreadsheet data manipulations and calculations. Series of programs carry out their tasks under the command of DOS batch programs.

Although the user does not have to write programs or macros to use the SWOPSIM framework, some knowledge about the working medium is helpful, especially when things go wrong. Experience has shown that many of the problems for potential users arise from an inadequate understanding of spreadsheets or PC DOS. Knowledgeable spreadsheet users, on the other hand, have quickly adapted the SWOPSIM framework to their own research agenda and have been able to modify default ERS SWOPSIM models to their particular research needs.

The Economics of SWOPSIM Models

The economics of models created by the SWOPSIM modeling framework assumes that a product sector in a country can be represented by a set of simple supply, demand, and trade equations. By creating these equations for all countries/regions, initializing the model to reproduce observed data, and allowing world markets for all products to clear, a linked world model is created.

For each region i and each product j in the model, demand (D) and supply (S) relationships are modeled as:

$$D_{ij} = D_{ij}(CP_{ij}, CP_{ik}, QS_{ih}, TD_{ij}) \quad (1)$$

$$S_{ij} = S_{ij}(PP_{ij}, PP_{ik} \text{ or } CP_{ik}, TS_{ij}) \quad (2)$$

where CP_{ij} and PP_{ij} are domestic incentive prices facing consumers and producers, respectively, of product j in country i . CP_{ik} and PP_{ik} are consumer and producer prices of products related to product j in either consumption or production, respectively. QS_{ih} in the demand function accounts for the use of product i as an intermediate input into the production of product h . QS_{ih} is typically a meat supply quantity which enters into demand functions for feed products. PP_{ik} in the supply function represents substitution possibilities for the producer. TD_{ij} and TS_{ij} in the demand and supply functions account for policies or economic factors that might shift the functions over time.

Trade is the difference between domestic supply and total domestic demand (absorption). World markets clear when net trade of a product across all regions sums to zero:

$$\sum_i T_{ij} = \sum_i S_{ij} - \sum_i D_{ij} \quad (3)$$

The policy structure is embedded in equations linking domestic and world prices. Domestic incentive prices depend on the levels of consumer and producer support (modeled in terms of consumer and producer support price wedges CSW_{ij} and PSW_{ij}), and on world prices denominated in local currency:

$$CP_{ij} = CSW_{ij} + F(E_i * WP_j) \quad (4)$$

$$PP_{ij} = PSW_{ij} + G(E_i * WP_j) \quad (5)$$

where E_i is the exchange rate of i with respect to the U.S. dollar, and WP_j is the world price of product j measured in U.S. dollars. SWOPSIM convention defines subsidies (payments to producers or consumers) as positive numbers; negative subsidies or taxes are collections from consumers and producers.

Support of any type is captured by calculating its equivalent in two types of wedges. First, there is a market support wedge where a trade payment (tariff or subsidy) or trade quota creates a price wedge between domestic and world prices. Second, there can be a direct payment wedge to producers or consumers which does not affect the observed market price but which is part of the domestic incentive price.

Functional relationships $F()$ and $G()$ allow the transmission of world to domestic prices to be less than or equal to 1. If equal to 1, then 100 percent of a world price change is transmitted domestically. A value of less than 1 indicates that the government intervenes to cushion domestic producers and/or consumers from experiencing the full change.

The SWOPSIM framework creates supply and demand equations with a constant elasticity form (57,58). The (constant) elasticities of feed demand are the shares of a product fed to produce a livestock product. Theoretical and practical constraints on model structure such as symmetry conditions or cross-price relationships derived from duality theory, are imposed on the elasticities actually used in the models (20,21).

SWOPSIM country models are initialized to a base year; that is, equation intercepts are calculated which fit each equation to base year parameters and data. A global model is then assembled where global trade for each product is balanced. This means that a global SWOPSIM model, before any external shock is administered, replicates the base data. Recalculating the spreadsheet to solve the model gives no change. This is the final test of the readiness of a SWOPSIM model.

Exogenous shocks are administered via changes in support wedges in price linkage equations ((4),(5)) or shifts in supply and demand equations ((1),(2)). Then, if a spreadsheet is recalculated, disequilibria caused by these shocks start a global model iterating to a new price-quantity balance where world markets for all products are again cleared.

After a global model solution has been obtained, several types of indicators can be calculated comparing the new equilibrium state to the base state. Standard Marshallian measures of producer and consumer surpluses and a host of other economic indicators are computed to study the economic welfare implications of policy changes (19,57,58).

Many of the augmentations to the SWOPSIM framework have relaxed some of the above characteristics and modified the economic structure of models. For example, Dixit and Roningen (10) modified the SWOPSIM framework to allow for bilateral trade flows using the Armington demand assumption. Similarly, Krissoff and Ballenger (35) relaxed the partial equilibrium assumption by including product aggregates defined to cover the whole economy and by examining agricultural and nonagricultural policy changes. Liapis has added input sectors to agricultural product sectors to account for input markets in liberalization experiments (44).

The SWOPSIM framework leaves the user with models in spreadsheets, allowing the researcher flexibility in adapting the standard economic models to particular research needs.

Data Requirements for SWOPSIM Models

The assembly of a consistent, global database is typically the most difficult part of any global modeling exercise. The SWOPSIM modeling framework allows the user to define model product and regional coverage. Several types of data for each commodity in each country are then required to construct standard SWOPSIM global models (57,61). These are:

- (1) Base year production, consumption, and trade data.
- (2) World reference prices and domestic prices.
- (3) Policies summarized as price wedges.
- (4) Supply and demand elasticities.
- (5) Price transmission elasticities.
- (6) Input-output relationships for derived demand.
- (7) Technical constraints on elasticities.
- (8) Exchange rates.
- (9) Macroeconomic data such as supply growth rates, income, and population and their growth rates (for demand shifters if a model is used for projections).

Global models are typically built around existing global data sets. For SWOPSIM models at ERS, global supply, demand, and trade data for temperate zone products are obtained from the U.S. Department of Agriculture's Foreign Agricultural Service (69). World price and exchange rate information are acquired from the International Monetary Fund (29) while domestic price and support data come from comprehensive studies of support to agriculture for many countries in the world done by ERS (72,73) and the OECD (55).

The creation of ERS SWOPSIM models has been accompanied by the assembly of several large data sets. The largest data set

includes supply and utilization data for 22 commodities in 36 countries/regions (69). Many applications of the SWOPSIM framework to particular research questions have involved the aggregation of these 36 regions into a more aggregate world data set (e.g. 61,75). The SWOPSIM framework does have some aggregation routines which facilitate the aggregations of elasticity sets, support measures, and base data (58). The advantage of starting with a large balanced global data set is that aggregations are also globally balanced (i.e. world trade is balanced for each product in the base year).

Parameters for SWOPSIM models in ERS have typically been taken from existing sources. The own- and cross-price elasticity estimates for demand and supply and the technical coefficients are based on a host of empirical studies (12,69,70). Parameters are typically adjusted based on reasonableness of simulation results.

Computer Hardware and Software Requirements

The SWOPSIM framework runs on personal computers (PCs). SWOPSIM models and supporting data are maintained in spreadsheets on PCs. The framework requires a specific configuration of a PC and requires storage space on a hard disk drive. The hardware requirements for the SWOPSIM framework and models partially depend upon the size (number of products and countries/regions) of models created. For a small model, the SWOPSIM framework typically requires an IBM or IBM compatible computer with about 4 megabyte (MB) available space on a C: hard drive and about 2 MB of random access memory (RAM).

SWOPSIM programs as well as model files are kept on the C: drive. Software must be installed that makes memory above 640 kilobytes (KB) available to the spreadsheet as "expanded" memory (some SWOPSIM operations use fairly large spreadsheets which require this feature). A D: drive of at least 1.4 MB is also required. D: may be a virtual drive or a partitioned part of a hard disk marked as the D: drive using the DOS SUBST command. The D: drive is used as the temporary storage place for all SWOPSIM input and output operations. When framework operations are completed, work must be saved manually to a model partition on the hard disk. Larger SWOPSIM models (e.g. 20-30 countries and commodities) will require more expanded memory and more disk space.

Installation of the SWOPSIM framework requires that SuperCalc 5.0 (Computer Associates International Inc.) spreadsheet software and DOS 3.3 or a later version be installed on a PC.³ The latest SWOPSIM version at ERS operates on the Revision D, 1989 version of SuperCalc 5.0 with a numeric coprocessor installed on the computer. Specialized software must be installed (typically in

³SuperCalc is a registered trademark of Computer Associates International Inc., 1240 McKay Drive, San Jose, CA 95131, 408-432-1727.

the CONFIG.SYS file) to make PC memory above 640 KB available to SuperCalc 5 as expanded memory. Such software is often machine specific.

A laser printer is preferred for report writing because it is fast and allows the user to print a lot of information on one page. The report writers that come with the SWOPSIM framework are set for a laser printer used at ERS.

The SWOPSIM framework software comes on a 1.44 MB 3.5" or 1.2 MB 5.25" floppy disk as a self-installing program. SWOPSIM programs can be loaded from the floppy disk onto the C: (hard) drive by running INSTALL A: from the A: disk drive (or INSTALL B: from the B: drive). The README file on the disk contains detailed installation instructions. If the SWOPSIM programs are to be changed, then a BASIC interpreter and compiler are needed. The listings of SWOPSIM programs are contained in appendices to the documentation (57,58).

Three subdirectories are created in the C: drive by the INSTALL program: SWOPSIM, BATCH, and DEMO. The SWOPSIM subdirectory has the compiled BASIC (all files with the .EXE extension) programs that carry out all SWOPSIM operations (they write spreadsheet macro commands). Microsoft BASRUN routines are needed on the C:\ drive (or root directory) to successfully operate the compiled BASIC (*.EXE) SWOPSIM programs. The BATCH subdirectory contains DOS batch programs which, in turn, control file manipulations, the executions of the BASIC macro-writing programs, and the execution of those macros in spreadsheets.

The disk containing the SWOPSIM software also has a self-installing demonstration (DEMO) model. When installed, the C:\DEMO subdirectory will have a 3-region, 22-commodity demonstration model of world agriculture built using the SWOPSIM framework. Steps in the creation of the DEMO model are illustrated later in this report.

Problems for users of the SWOPSIM framework may be spreadsheet related (e.g. improper default settings on the spreadsheet), DOS related (e.g. the wrong DOS version), or model related (e.g. information entered in the wrong place or form in a model spreadsheet).

Full documentation of the current version of the SWOPSIM framework is forthcoming (58). If a potential user has problems, call the authors at 202-219-0630 or fax examples/descriptions of problems to 202-219-0942. Suggestions concerning the SWOPSIM framework are welcome.

To help the potential user evaluate the SWOPSIM framework, the steps in constructing the demonstration model DEMO are illustrated. The presentation is organized around a flowchart of SWOPSIM model building procedures and the discussion of steps is illustrated with pictures of computer screens and spreadsheets.

Building the World Model DEMO With the SWOPSIM Framework

The SWOPSIM framework is a set of programs that automate the construction of models in spreadsheets. This section illustrates the use of the framework to build a demonstration model. The process is summarized in the flowchart on the following page.

There are a number of procedures that need to be undertaken to create a SWOPSIM world model. These include making a model subdirectory, establishing a master model file, constructing country base data spreadsheets, creating policy support spreadsheets, constructing country spreadsheets, and generating a world model. An illustrated explanation of the framework follows, emphasizing important operations shown in the flowchart.

Operations in the SWOPSIM Framework

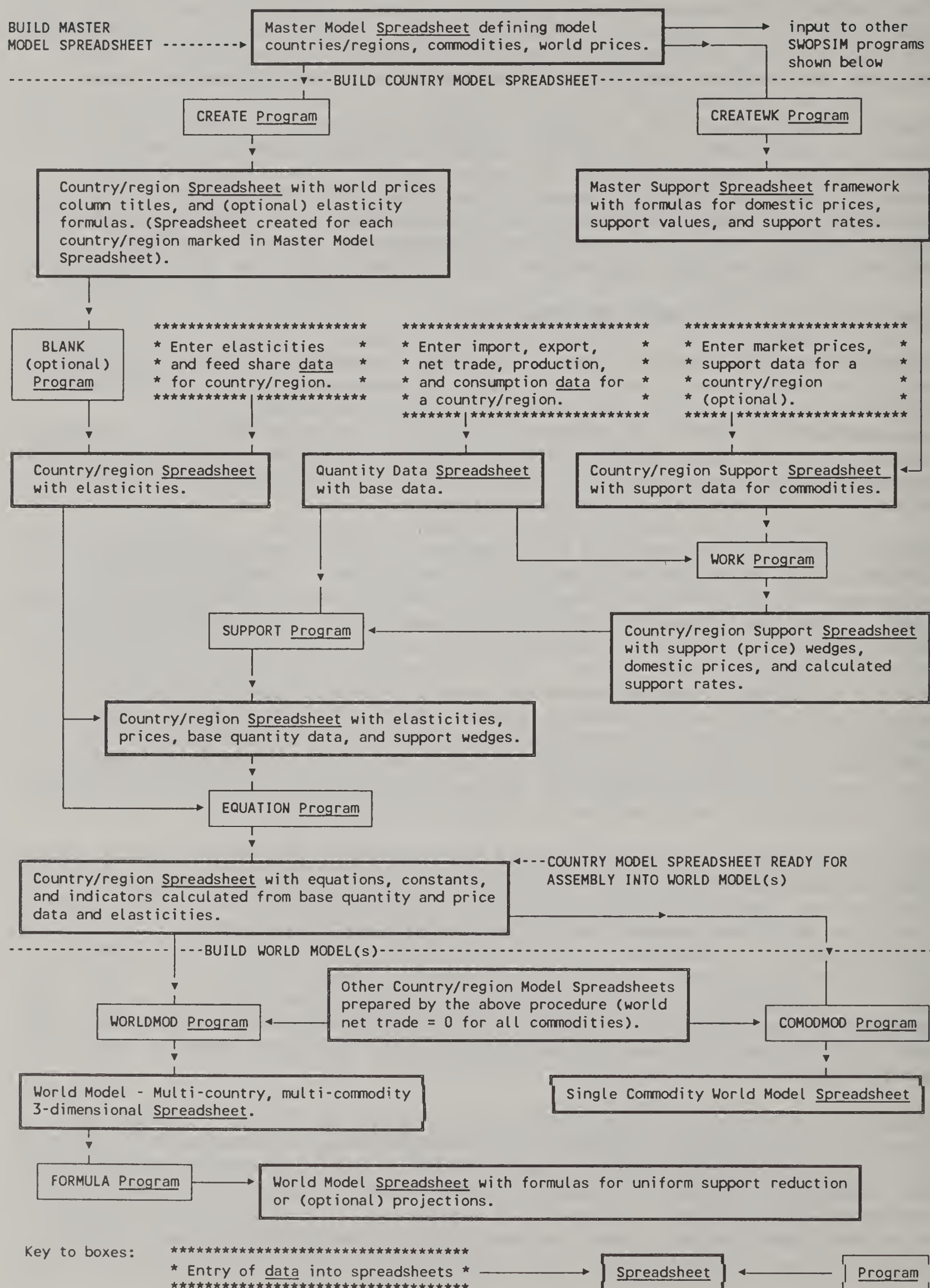
SWOPSIM models and data are contained in spreadsheets. SWOPSIM programs carry out operations upon spreadsheets to collect data, write equations, etc. and store the new information in spreadsheets. Until a program is run, spreadsheets for a model are all stored on a model subdirectory. In the case of the DEMO demonstration model used in this report, the spreadsheets are contained in the C:\DEMO subdirectory.

When a program is invoked to perform a task, the spreadsheets to be operated upon are copied to the D: drive. Compiled BASIC programs are run which create spreadsheet macros to carry out the tasks with the spreadsheets. When completed, spreadsheets and other temporary files that are not needed are erased from the D: drive by the batch program. The SWOPSIM user then is left with new or modified spreadsheets on the D: drive which must be manually copied to the model subdirectory if they are to be permanently saved. Different operations are carried out by invoking the different programs (programs are marked by single line boxes in the flowchart, while spreadsheets at various stage of construction are marked by double line boxes).

The programming strategy behind the SWOPSIM framework is to make the spreadsheet the repository for model inputs and outputs. Tedious or repetitive spreadsheet operations are automated with compiled BASIC programs which write spreadsheet macro (programming) commands. All operations are directed by simple DOS batch programs. Since the output of any operation is put on the D: (temporary) drive, mistakes or problems will not wipe out existing spreadsheets. After a manual check of the results, the user can write the new spreadsheets over the old ones on the model file.

SWOPSIM routines have self-prompting instructions. Typing the name of the routine without the accompanying parameters required will give an explanatory screen plus an error message asking for the first parameter. Screen 1 shows what a user will see if CREATEWK (the name of a SWOPSIM program) is typed without the required model name. The screen shows the program name along with a brief description, the requirements for the program to run

SWOPSIM Model Building Flowchart



Screen 1--Self Documenting Example

successfully, the output expected, and the command term and prompts required to run the program.

For example, the program CREATEWK needs the four-character model NAME to run correctly. The message at the bottom of the screen below the

COMMAND line tells the user that the model NAME was not entered. The screen text above the error message gives a brief description of the program CREATEWK, what is needed to run it, and what the output will be. The user can purposely type CREATEWK without the program NAME to invoke the screen briefing.

```
SWOPSIM Program
-----
CREATEWK      Program to create a master support spreadsheet for model
               NAME which contains formulas to calculate price wedges for
               SWOPSIM models from data on Producer and Consumer Subsidy
               Equivalents (PSEs and CSEs). This master spreadsheet is
               used each time the program WORK is run to update a support
               spreadsheet for a country.
REQUIREMENTS Model master NAME.PRN file must be on C:\NAME subdirectory.
OUTPUT (D:)   Master support spreadsheet NAMEWORK.CAL and SuperCalc 5
               macro program NAMETHIN.XQT which is used for WORK program.
-----
COMMAND      CREATEWK NAME
-----
ERROR = You forgot model NAME; Enter: CREATEWK NAME
C:\>
```

Making a Model Subdirectory

Before starting any operation with SWOPSIM, one must establish a subdirectory with a four-character model name (e.g. DEMO) on the C: drive. This subdirectory is used to permanently store all files that are specific to a particular version of a SWOPSIM model. SWOPSIM operations, on the other hand, save all files to the D: (temporary) drive. Files to be kept permanently must be manually transferred to the model subdirectory using the DOS COPY command when the operation is complete.

Establishing a Master Model File

A master model file is a spreadsheet that defines the product and country coverage of the model to be built, and includes world price information on all products that are to be included (see Spreadsheet 1--Master Model File-DEMO).

All model-building exercises with the SWOPSIM framework begin with the construction of a master model file. A master model file can either be created manually or reworked from an existing file. For example, the DEMO.CAL file can be renamed and modified to suit a particular country and product coverage.

A two-letter nomenclature is required to identify all countries and products (coverage). The country codes are input across columns in row 3 (US, EC, RW) while the product codes are placed in column A beginning from row 5 (BF for beef, PK for pork, ML for mutton & lamb, etc.). The heart of the model specification is the block of codes in cells B5:G26 which define product and country coverage in DEMO. Each cell contains a code which tells

[illegible]

Matrix cell codes (D, I, or .) partly define the economic structure (supply and demand equations) for that product in the particular country. Sector codes ((IU, I, IB), (IN, OU), (NT)), placed in consecutive columns after cell codes, identify whether the product sector is an input, an intermediate input or output, or a nontraded product (57, 58). Nomenclatures for the model DEMO are defined in other parts of the spreadsheet. World reference prices must always be entered in column AR.

12

Note that the .PRN file should be checked/edited so that the first letter of the commodity code (the B in BF in DEMO.PRN) is in the 7th row and 7th column.

Constructing Country Base Quantity Data Spreadsheets

A country base domestic and trade quantity data spreadsheet contains country imports, exports, net trade (exports minus imports), production, and total demand for each product in the model. This spreadsheet must exist for each country/region in the model.

Spreadsheet 2 shows imports, exports, net trade, production, and consumption quantity data in columns B through F starting in row 3 for the US for the model DEMO. Common units must be used for all products (ERS SWOPSIM models use 1000 metric tons). Other columns and rows can contain codes and headings as illustrated above. Base quantity data files must be saved for each country in a model on the model subdirectory. These files are the primary storage for the base data. If you change base data, it has to be done in these files. For a world model to be balanced before policies are changed, the net trade (column D) must sum to zero across all countries. Adjustments to achieve this balance are made in the RW base data file.

Spreadsheet 2--Base Quantity Data Spreadsheet

	A	B	C	D	E	F	G	H	I	J
1	DEMOTUS	Total	Total	Net	Domestic	Domestic	TSDATA			
2	1989	Imports	Exports	Trade	Supply	Demand	PRow#->	3		
3	BF	987	482	-505	10655	11160		BeeF & veal		
4	PK	407	122	-285	7176	7461		PorK		
5	ML	27	2	-25	157	182		Mutton, Lamb & goat		
6	PM	0	426	426	9984	9558		Poultry Meat		
7	PE	10	83	73	4104	4031		Poultry Eggs		
8	DM	0	0	0	65432	65432		Dairy Milk		
9	DB	2	68	66	572	506		Dairy - Butter		
10	DC	125	7	-118	2531	2649		Dairy - Cheese		
11	DP	1	145	144	395	251		Dairy - Powder		
12	WH	637	33557	32920	55406	22486		WHeat		
13	CN	51	59693	59642	191198	131556		CoRN		
14	CG	1360	9208	7848	30245	22397		other Coarse Grains		
15	RI	162	2497	2335	5010	2675		Rice		
16	SB	100	16874	16774	52439	35665		SoyBeans		
17	SM	5	4404	4399	24518	20119		SoyMeal		
18	SO	23	680	657	5743	5086		SoyOil		
19	OS	349	607	258	6900	6642		Other oilSeeds		
20	OM	376	131	-245	2242	2487		Other Meals		
21	OO	979	435	-544	1068	1612		Other Oils		
22	CT	0	1698	1698	2655	957		CoTton		
23	SU	1753	463	-1290	6089	7379		SUGar		
24	TB	180	225	45	559	514		ToBacco		

Creating Policy Support Spreadsheets

A policy support spreadsheet is a spreadsheet that houses policy data (from PSE and CSE calculations) which are used to generate producer and consumer incentive prices, support wedges, base government expenditures, quota rents, and other measures of economic welfare. A policy support spreadsheet should exist for all countries in the model.

A generic policy support spreadsheet (NAMEWORK.CAL) containing formulas for a model is created by running CREATEWK (see Screen 1). To create a support spreadsheet for a specific region, the generic spreadsheet must be saved under the region name. For example, the US support spreadsheet would be DEMOSUS.CAL. The file(s) created will have no data, only commodity nomenclatures and column headings.

Appendix A contains a full printout of DEMOSUS. Spreadsheet 3 shows part of DEMOSUS, the policy support spreadsheet that is used for entering support data. Data from PSE and CSE calculations for production (in 1000 metric tons) and market price (local currency) go into columns AE and AH, respectively (rows 39 through 60 in DEMOSUS). The quantity data in these columns may be somewhat different than that in column E of the base data spreadsheet (Spreadsheet 2), depending upon where the data for calculating the policy wedges were acquired.

Input data on support (categorized as market support, direct producer support, other producer support, and direct consumer support) goes in columns CU:CX (rows 39 through 60 in DEMOSUS). This categorization follows the USDA (72) convention of reporting producer and consumer (PSE, CSE) support (price intervention or market support, direct income support, other producer support, and direct consumer support). All numbers are in local currency; the local currency to U.S. dollar exchange rate must be put into cell K1 (DEMOSUS, Appendix A).

Next, the user must identify whether the market price support component of domestic support in column AB is derived through 1 (quota, marketing board, or other control), 2 (export taxes), or 3 (import tariffs). Market price support refers to the price wedge created by border measures. Hence, if an import quota or a marketing board creates the price gap, a 1 is put in the appropriate cell in column AB. Export taxes or import tariffs have a revenue component associated with them and should be marked by a 2 or 3. This procedure allows one to calculate the budget impact of market support policies.

The policy support spreadsheet values for each country in a model should be saved on the model subdirectory. Then, the program WORK is run to create the support wedges, the producer and consumer incentive prices, budgetary information, and other indicators. WORK will also load base data from the country base data spreadsheet. After WORK has run, the completed support spreadsheet should be saved on the model subdirectory.

Spreadsheet 3--Portions of Policy Support Spreadsheet

	AB	AC	AE	AF	AG	AH	CU	CV	CW	CX
3	1=Quota,	12/13/90								
4	2=Exp.T.									
5	3=Imp.T.	US								
6										
7	3	BF								
8		PK								
9	3	ML								
10	2	PM								
11	2	PE								
12	1	DM								
13	2	DB								
14	1	DC								
15	2	DP								
16	2	WH								
17		CN								
18		CG								
19		RI								
20		SB								
21		SM								
22		SO								
23		OS								
24		OM								
25		OO								
26		CT								
27	1	SU								
28		TB								
.										
36										
37		US	ASUPPLY	ADEMAND	AMKPRICE	US				
38										
39		BF	10660	11165	2504	470	203	1804	153	
40		PK	7174	7459	1290			655	27	
41		ML	152	176	2394	2		33		
42		PM	10029	9601	1113	101	81	715	81	
43		PE	4086	4013	1150	40		238	31	
44		DM	65432	65432	301	5544		1570	443.21	
45		DB	572	506	2820	454			75.44	
46		DC	2531	2649	3060	2180			377.2	
47		DP	395	251	2326	259			47.15	
48		WH	55406	22486	140	280	1027	626	52	
49		CN	191198	131556	89		4885	2508	7	
50		CG	15694	11622	82		412	117		
51		RI	4910	2622	223		520	101	22	
52		SB	52439	35665	203		80	758	4	
53		SM			170					
54		SO			452					
55		OS			119					
56		OM			185					
57		OO			441					
58		CT	2655	957	1270		1000			
59		SU	5613	6802	356	594	3	125		
60		TB			3583					

The policy support spreadsheet also has indicators and checks on policy data that help gauge its "reasonableness." For example, PSEs are recalculated with model base and support data and can be compared with those published with the source support data. Any change of support data or base quantity data requires re-running WORK to re-create a new set of price wedges and supporting data.

Once the program WORK is invoked with the proper prompts, the program runs until completed. WORK takes formulas from the NAMEWORK generic file and uses them to update prices, price wedges, and other data. Resulting values are saved on the D: drive in NAMEsCD (DEMOsUS is the example for the model DEMO in Appendix A and Spreadsheet 3).

```

                                SWOPSIM Program
-----
WORK      Program to recalculate a country support spreadsheet
          for country CD in the model NAME. WORK must be used if
          support/market price or base data is changed.
REQUIREMENTS Master support spreadsheet file NAMEWORK.CAL, country
          support spreadsheet file NAMEsCD.CAL, and country base
          data file NAMEtCD.CAL on the C:\NAME subdirectory.
OUTPUT (D:) Two country/region support spreadsheets. NAMEsCD.CAL
          contains the recalculated support information without
          formulas. This file should be saved to the C:\NAME
          subdirectory. NAMEsCDF.CAL contains the updated support
          information with calculating formulas for reference. It
          need not be saved. (If WORK is run in a multi-country
          loop only the last formula support sheet in the loop
          will remain).
-----
COMMAND   WORK NAME CD
-----
ERROR = You forgot model NAME; Enter: WORK NAME CD
C:\>

```

Constructing a Country Spreadsheet

A country spreadsheet contains all of the country model data on supply, demand, and trade. It also includes supply and demand elasticities and other model parameters, along with producer and consumer incentive prices and price wedge information created in the policy support spreadsheet. All of this information, when correctly entered, is used by the program EQUATION to create supply and demand equations as well as economic indicators (which are also kept in this spreadsheet). A country spreadsheet is required for each country/region defined in the master model file. Analytically, it is equivalent to a multi-commodity country model assuming world prices fixed.

The country spreadsheet for each region (see the example for DEMO in Appendix B--Country Model Spreadsheet--DEMObUS) specified in the master model file is originally built by running the program CREATE (see Screen 3). It contains cells to input supply and demand elasticities and information on base quantities and prices. The created spreadsheets have no data (except world prices in column B from the master model file), just formulas in selected cells.

The actual prompt when CREATE is run is shown in Screen 3. The program prompts for a yes (Y) or no (N) for "symmetry" formulas to be written in the elasticity matrices (see 57,58). Note that other programs that do not have any internal prompts will run uninterrupted, sometimes giving a progress message on the screen.

SWOPSIM provides two options regarding the elasticities: one can either input all elasticities as thought appropriate, or one can use relationships from demand theory. If the first approach is followed, answer no (N) to the symmetry questions in CREATE, and

Screen 3--Program CREATE

input elasticities as desired. Alternatively, the symmetry option can be selected and/or other patterns such as homogeneity can be put on the elasticities that are entered manually.

Screen 4 shows the screen prompts seen when the program CREATE is run with the model named DEMO.

Note that the program has read the DEMO.PRN file for country and product codes and asks for a yes (Y) or (N) for symmetry formulas in (elasticity) matrices. Most SWOPSIM programs will show country/region and products codes at the beginning of their operation.

```

SWOPSIM Program
-----
CREATE      Program to create all the template SWOPSIM country/region
            files for the model NAME from a master file. Each file,
            NAMEbcd.CAL (CD = country CoDe) must be saved to the
            C:\NAME subdirectory. Then elasticities, model parameters,
            base data, and support price wedges must be correctly
            entered into each file before the equations are written
            with the program EQUATION. The program also creates a
            batch file, NAMELOOP.BAT which must be saved in the
            C:\BATCH subdirectory. This file allows automatic
            execution of SWOPSIM programs for all countries in NAME.
REQUIREMENTS A C:\NAME subdirectory must contain the master model
            file NAME.CAL and its ASCII version, NAME.PRN. The C:
            directory should contain INOUT.TXT and SC5.TXT files,
            the SuperCalc 5 spreadsheet (on a C: subdirectory) with a
            SC.BAT calling file, BASRUN programs, and SWOPSIM
            correctly installed.
OUTPUT (D:)  NAMEbcd.CAL file for each country/region (with CoDe CD)
            in the model NAME and a NAMELOOP.BAT file.
-----
COMMAND      CREATE NAME
-----
ERROR = You forgot model NAME; Enter: CREATE NAME
C:\>

```

Screen 4--Program Prompt for CREATE

If on the other hand, one wishes to minimize the search for elasticities and impose relationships based on demand theory, and one is building a model based on the ERS 22-product SWOPSIM database, then the optional program BLANK can be run after the country model spreadsheets have been created and saved on the model subdirectory.

```

Program to create new blank country/region spreadsheets from master
file (spreadsheet). The new spreadsheets will be empty -
elasticities and base data must be added to the new spreadsheets in
order to create constants and equations with the 'EQUATION'
program. Master '.CAL' AND '.PRN' files must be on a subdirectory.

Be sure to answer all questions with CAPITAL LETTERS!

Reading master file - C:\DEMO.PRN

Countries/regions are:

US EC RW

Product groups are:

BF PK ML PM PE DM DB DC DP WH CN CG RI SB SM SO OS OM OO CT SU TB

Do you want symmetry formulas in matrices (Y or N)?

```


Screen 5--Program BLANK

BLANK will impose three types of specifications:

(1) joint product specification for the dairy and oilseeds sectors, (2) intermediate demand relationship

between output supply (livestock

products) and input use (e.g. corn), and (3)

input demand specification (e.g. corn) based on intermediate and final demand relationships.

SWOPSIM Program	
BLANK	Optional program to blank out unneeded parts of country elasticity matrices and make any other adjustments for the NAME model country file NAMEbCD.
REQUIREMENTS	Country model file NAMEbCD.CAL, ASCII file NAMEBLNK.TXT (containing cell blocks to be blanked), and ASCII SuperCalc 5 macro file NAMEXQT.XQT (containing macros to make adjustments, write formulas, etc.) on the C:\NAME subdirectory. (Caution, if some country models do not have some sectors, NAMEXQT.XQT's actions may have to be manually erased).
OUTPUT (D:)	Blanked/adjusted country model file.
COMMAND	BLANK NAME CD
ERROR = You forgot model NAME; Enter: BLANK NAME CD	
C:\>	

Mechanically, BLANK uses prepared spreadsheet cell designation template files to blank out unwanted cells and a file of spreadsheet macros to enter formulas imposing a structure on elasticities (20,58). It is important to understand that although SWOPSIM models have simple constant elasticity specification, a potential user may impose any desired properties on those elasticities.

If symmetry was selected (Screen 4), the country spreadsheet protects those that are automatically calculated by symmetry formulas and unprotects the cells that need to have elasticities inserted exogenously.

There are three other sets of parameters relating to the demand and supply elasticity matrices that are input into the example DEMO country spreadsheet to complete the specification: the share of each feed (WH, CN, etc.) used in the production of the various livestock products (SBF, SPK, etc., blocks X33:AJ45, Appendix B), the own-price elasticity of final demand for products used as inputs (e.g. elasticity of demand for wheat used for nonfeed purposes, FLDELAS-block AO33:AO45, Appendix B), and, the proportion of these products not used as inputs to other products in the model (FLDSHARE-block AN33:AN45, Appendix B).

Once this stage has been reached, the country spreadsheet is saved on the model subdirectory as a .CAL file (DEMObUS.CAL for the demonstration example). Then, the program SUPPORT is run which takes the price, policy, and budget information from the country support spreadsheet as well as the base data from the country base data spreadsheet and copies it into the country model spreadsheet. The country model spreadsheet is saved again on the model subdirectory (in the example, C:\DEMO\DEMObUS). At this point a final visual check of the reasonableness of all of

Screen 6--Program SUPPORT

the parameters, elasticities, and data in the country spreadsheet should be made to prepare for the final country model operation. The country spreadsheet will be ready when the program EQUATION has been run, that is, initialization of the country model to base year data.

The prompt for program EQUATION is shown in Screen 7. This program takes elasticities and base price and quantity data entered into the country spreadsheet and writes standard constant elasticity equations into the same spreadsheet (57,58). It

also writes equations for welfare measures and other economic indicators (see Appendix D--SWOPSIM Country Model Variable List). A country spreadsheet is akin to a country model with world prices fixed. The newly initialized country file must be saved on the model subdirectory. All of the above procedures for country support and model spreadsheets, including EQUATION, must be repeated for all countries in a model. There are batch looping programs (DEMOLoop) that can carry out any of the model operations for all countries in a model (58).

When all of the above operations are completed and all files are saved on the model subdirectory, the user is ready to assemble a global model. This final program takes the essential equations and parameters from each country spreadsheet and combines them, one country to a page, in a multi-page spreadsheet. A global trade linkage page is created along with a global market clearing

```

                                SWOPSIM Program
-----
SUPPORT      Program to add prices and price wedges from a support
              spreadsheet and base data from a quantity base data
              spreadsheet to a country model spreadsheet NAMEbCD.CAL.
              (Caution, if NAMEbCD.CAL contains formulas relating
              elasticities, calculated elasticities may change--check
              new elasticities manually before running EQUATION to
              to re-initialize the model).
REQUIREMENTS Country model spreadsheet NAMEbCD.CAL, support
              spreadsheet NAMEsCD.cal, and base quantity data
              spreadsheet NAMEtCD.CAL must be on C:\NAME model
              subdirectory.
OUTPUT (D:)   Country model spreadsheet with new prices, price wedges,
              and base quantity data.
-----
COMMAND      SUPPORT NAME CD
-----
ERROR = You forgot model NAME; Enter: SUPPORT NAME CD
C:\>

```

Screen 7--Program EQUATION

```

                                SWOPSIM Program
-----
EQUATION      Program to initialize constants to base data, write
              equations, and write economic indicator formulas in
              country spreadsheet NAMEbCD.CAL.
REQUIREMENTS Country spreadsheet NAMEbCD.CAL with base data,
              prices and price wedges, elasticities, and all other
              parameters must be on model subdirectory C:\NAME.
OUTPUT (D:)   New initialized country spreadsheet NAMEbCD.
-----
COMMAND      EQUATION NAME CD
-----
ERROR = You forgot model NAME; Enter: EQUATION NAME CD
C:\>

```


mechanism. There is also an alternative of generating a global single commodity model from the country model spreadsheets.

Generating a Multi-Commodity World Model

A SWOPSIM world model is the compilation of the various country models into one large spreadsheet to create a multi-commodity, multi-country world model. Implications of policy changes can be studied across countries and commodities. The world model forms a multi-page spreadsheet with one page to a country and a beginning page of equations to close world product markets.

Once country model spreadsheets are fully prepared, a multi-commodity, multi-country world model based on the specifications in the master model file can be created by running the program WORLDMOD (Screens 8 and 9). WORLDMOD takes selected product rows from country spreadsheets and assembles a world model in a new multi-page spreadsheet. The world model spreadsheet contains the country equations and the world market equilibrium mechanism but does not contain economic indicators or base data. If global trade

Screen 8--Program WORLDMOD

```

                                SWOPSIM Program
-----
WORLDMOD      Program to create a world multi-product multi-country
               world model from country/region model spreadsheets
               in the model subdirectory, C:\NAME. The country
               spreadsheets should be fully completed and initialized.
REQUIREMENTS The C:\NAME subdirectory must contain initialized country/
               region spreadsheets for all countries in the model NAME.
OUTPUT (D:)   A NAMEWD.CAL world model spreadsheet with the first page
               containing the world market clearing mechanism and
               subsequent pages containing country model equations and
               variables that can be used to apply policy and other
               economic shocks to the world model.
-----
COMMAND       WORLDMOD  NAME
-----
ERROR = You forgot model NAME; Enter: WORLDMOD NAME
C:\>

```

Screen 9--Prompt for Program WORLDMOD

```

Program to create a world multi-region multi-product model spreadsheet
from country/region spreadsheets. The spreadsheets must contain base
data, elasticities, and equations before the world model is
created with this program.

Reading master file - DEMO

Countries/regions are:

US EC RW

Product groups are:

BF PK ML PM PE DM DB DC DP WH CN CG RI SB SM SO OS OM OO CT SU TB

Rightmost column is CU

Hold any country/region constant (Y or N (default))?

Hold constant any product groups (Y or N (default))?

```


balances, the global model is in equilibrium at the base data (reproduces the base). This world model (DEMOWD.cal) must be saved on the model subdirectory.

Screen 9 shows the prompts for the program WORLDMOD. The prompts allow the user to hold either a country(s) or product(s) (or both) constant while constructing a world model from the country model spreadsheets. This feature replaces equations with values so that the world model will not iterate on the fixed values. This is a simple but powerful option for SWOPSIM models (57,58).

Simulating a World Model

The world model is created in a balanced state, e.g. it reproduces the base data. If the spreadsheet is recalculated (solved), nothing happens; indeed this is a "test" of the successful assembly of a world model with the program WORLDMOD.

If a policy shock is inserted by entering a supply or demand shift or changing a price wedge, an initial disequilibrium will be created and world trade will be unbalanced. When the spreadsheet is recalculated, it will seek a new equilibrium which rebalances world trade via world price changes which are fed back into country pages of the world model (57,58). The spreadsheet "solves" for the new equilibrium automatically with its internal solution algorithm (Screen 10).

The spreadsheet environment is advantageous for the solution of simultaneous equations because the solution process can be stopped at any time and troublesome variables can be examined at will. However, spreadsheets are not as fast at solving simultaneous equations as

tailored computer algorithms. If model size can be kept down, smaller models solve considerably faster in spreadsheets than larger ones.

Screen 10 shows part of page 1 of DEMOWD (DEMOWD!1), the world market solution mechanism in a

Screen 10--Part of a Balanced DEMOWD

1	A		AE		AF		AG		AH		AI		AJ		AK
51															
52	DEMOWD		WDTTRADE				WEIGHT		LWDPRICE				WDPRICED		WDPRICE%
53	BF		0				.8		2567.00				0		.00
54	PK		0				.8		2176.00				0		.00
55	ML		0				.8		2321.00				0		.00
56	PM		0				.8		1039.00				0		.00
57	PE		0				.8		1696.00				0		.00
58	DM		0				0		272.00				0		.00
59	DB		0				.8		2866.00				0		.00
60	DC		0				.8		3009.00				0		.00
61	DP		0				.8		2326.00				0		.00
62	WH		0				.8		169.00				0		.00
63	CN		0				.8		111.00				0		.00
64	CG		0				.8		105.00				0		.00
65	RI		0				.8		320.00				0		.00
66	SB		0				.8		275.00				0		.00
67	SM		0				.8		247.00				0		.00
68	SO		0				.8		431.00				0		.00
69	OS		0				.8		630.00				0		.00
70	OM		0				.8		200.00				0		.00
DEMOWD!1!AE51															
Width: 9 Memory: 3486 Last Col/Row:AK74															
1>															

Screen 11--Interrupted Solution-DEMOWD

balanced state. The world trade column (WDTRADE) contains zeros and the world price change column, WDPRICE%, registers no change. A view of an interrupted solution from DEMOWD, where world trade is unbalanced and world price changes are occurring, is shown in Screen 11. As world markets clear, world trade will clear for each product, world price changes will settle down to constant values, and the iteration process will stop.

A SWOPSIM option is available to simplify the configuration of the world model for a liberalization or projection scenario if the model is built from the ERS 22-product SWOPSIM data set. The program FORMULA can insert formulas which simplify liberalization and/or projection scenarios.

FORMULA inserts "liberalization" formulas in columns N, O, P, and Q of the world model pages for countries where support is to be eliminated. To liberalize fully, a 1 is put into cells AJ1, AK1, AL1, AM1 for those countries (pages) to be liberalized. A number

1	A	AE	AF	AG	AH	AI	AJ	AK
51								
52	DEMOWD	WDTRADE		WEIGHT	LWDPRICE		WDPRICED	WDPRICE%
53	BF	-1517		.8	2742.13		175	6.82
54	PK	-625		.8	2222.97		47	2.16
55	ML	-381		.8	2887.83		431	18.57
56	PM	-1240		.8	1243.88		170	16.32
57	PE	-327		.8	1724.11		15	.88
58	DM	4012		0	272.00		0	.00
59	DB	-618		.8	4210.50		1054	36.77
60	DC	-1074		.8	4814.78		1458	48.47
61	DP	-594		.8	3571.11		818	35.17
62	WH	2028		.8	167.63		-1	-.51
63	CN	-12464		.8	115.66		2	1.99
64	CG	-8486		.8	109.58		2	2.31
65	RI	-256		.8	320.46		0	.08
66	SB	1935		.8	258.89		-12	-4.46
67	SM	335		.8	232.38		-14	-5.55
68	SO	1		.8	431.20		0	.05
69	OS	790		.8	615.32		-11	-1.74
70	OM	1177		.8	184.86		-11	-5.71

DEMOWD!1!AE51
terminated
Width: 9 Memory: 3476 Last Col/Row:AK74
1>

Screen 12--Program FORMULA

```

SWOPSIM Program
-----
FORMULA      Program to add liberalization and/or projection formulas
              to an existing world model spreadsheet NAMEWD.
              The liberalization formulas option allows the full or
              partial liberalization of all products in the world model.
              The projection formula options inserts shifters for
              supply equations based on growth rates and for demand
              equations based on growth rates of per capita income and
              population. This is an optional program.
REQUIREMENTS A world model spreadsheet on the C:\NAME subdirectory.
OUTPUT (D:)   NAMEWD.CAL world model with formulas.
-----
COMMAND      FORMULA  NAME
-----
ERROR = You forgot model NAME; Enter: FORMULA NAME
C:\>

```


smaller than 1 is used for partial liberalization, for example, .50 for a 50-percent liberalization.

The FORMULA program also has an option for projection formulas if the world model is to be used for static projections. If this option is selected, growth rates of supply, per capita income, and population (entered in the country spreadsheets) serve to shift supply and demand schedules into projected positions (58).

Once a solution is reached, it must be saved (only values) as NAMEWM?.cal (e.g. DEMOWM1.cal) on the model subdirectory. A one or two digit letter or number can be used to uniquely name each solution. Before saving the solution, the selected name should be typed in column AE above the WDTRADE column head. Comments defining this particular solution can be typed to the right of NAMEWM? in the solution spreadsheet.

Since the world model contains only the essential equations for countries and products, additional external work must be done to calculate indicators and measures of change of the solution versus the base period data. Recall that the indicators are kept in the country spreadsheets. It is possible to manually combine these indicators with world model solution values; however, output programs can greatly simplify this process. Output programs, in contrast to SWOPSIM model building programs, are not generic; that is, they are tailored to writing reports of results for models of specific sizes.

Producing SWOPSIM Output

Since SWOPSIM data and models are contained in spreadsheets, the contents are available via common spreadsheet output commands. However, output routines for SWOPSIM spreadsheets make it much easier to print summary elasticity data, base data, and comprehensive listings of solution output, including all of the indicator variables. Since the reports written by output routines depend

upon model size, the software must be modified if the commodity coverage differs from the 22 categories in the DEMO or other ERS models.

The program EOUT (Screen 13) prints a 1-page summary of country supply, demand, and feed share

Screen 13--Output Program-EOUT

SWOPSIM Output Program	
EOUT	Program to put a page of country Elasticities OUT to a printer or a disk file. Elasticities for supply, demand, and feed demand are included.
REQUIREMENTS	Country model file (NAMEbcd.CAL) containing elasticities on the model subdirectory. The batch file PRINTSOL must be available and configured on the batch subdirectory if print option is used. The template file NAMESUP.CAL must be on the NAME model subdirectory to format the output.
OUTPUT (D:)	One page file of elasticities from a model (NAME) country (CD) spreadsheet on to the printer (P) or to a disk file (F).
COMMAND	EOUT NAME CD P (or F)
ERROR = You forgot model NAME; Enter: EOUT NAME CD P(or F)	
C:\>	

Screen 14--Output Program BOUT

elasticities (Appendix C). Examples of printed output from the DEMO model are found in Appendix C--Output Examples --EOUT, BOUT, SOUT.

The BOUT program (Screen 14) prints a 1-page summary of price, quantity, and support data for each country/region (Appendix C). BOUT collects data from country base data, model, and support spreadsheets. BOUT and other output programs rely on output spreadsheet templates which use cross spreadsheet reference capability to access the contents of several spreadsheets from the template. Once designed for a particular model, the templates are accessed by batch file programming.

```

                                SWOPSIM Output Program
-----
BOUT          Program to put a page of country Base data OUT for the
              model NAME to a printer or to a disk file. Base data
              includes quantities, prices, and support information from
              the country model, base data, and support spreadsheets.
REQUIREMENTS Country model spreadsheet (NAMEbCD.CAL) and country support
              spreadsheet file (NAMEsCD) on model NAME subdirectory.
              The batch file PRINTSQL must be available and configured
              on the batch subdirectory if the print option is used.
              The template file NAMEBASE.CAL must be on the NAME model
              subdirectory to collect and format the base data output.
OUTPUT (D:)   One page printout of model (NAME) base data for
              country (CD) on the printer (P) or to a disk file (F).
-----
COMMAND      BOUT  NAME CD P(or F)
-----
ERROR = You forgot model NAME; Enter: BOUT NAME CD P(or F)
C:\>

```

Screen 15--Output Program SOUT

```

                                SWOPSIM Output Program
-----
SOUT          Program to put a file of country Solution values OUT
              to the printer or a disk.
REQUIREMENTS Solution file X, NAMEWMX.CAL, on model NAME subdirectory.
              Template files NAMESOUT.CAL for the solution output and
              NAMEANAL.cal for the analysis output on the model
              subdirectory. Three files are also called which can be
              customized. PRINTSQL.BAT configures the printer,
              NAMESOUT.BAT converts a country code to a model page
              number, and NamerowC.BAT gives the row and columns of
              the model solution file.
INPUT         Model NAME, country/region CoDe, solution code X (1 or
              2 digits), and P or F for printer or disk file.
OUTPUT (D:)   Printout or disk file NAMECDM.PRN. If disk file is chosen,
              a file (NAMECDM.CAL) is also created. This file can be
              saved for access by other output programs such as TABLE.
              Analysis of the solution is produced on the D: drive as
              NAMECDAX.CAL (and NAMECDAX.PRN if the F option is chosen).
-----
COMMAND      SOUT  NAME CD X P(or F)
-----
ERROR = You forgot model NAME; Enter: SOUT NAME CD X P(or F)
C:\>

```

There are two ways to view a SWOPSIM solution. The most obvious means would be to look at the solution output on the screen. This may be appropriate in cases where the intent is to look at a few selected model variables. But, in the vast majority of cases, the information contained on the screen may be inadequate either because it is cumbersome paging through the screens or because the world model on the screen does not contain economic indicator information resulting from policy changes.

Under these circumstances, it is helpful to use the SOUT program (Screen 15). SOUT is a batch program that prepares a three page file of the solution for a selected country inclusive of all the economic welfare indicators specified in the country spreadsheets. The third page is a matrix which breaks down the supply and demand effects into their components so the user can gauge the relative importance of factors producing changes. The file produced by SOUT may be printed or written out to disk. If the file is to be printed, the printer must be set to accommodate 209 character wide printouts in the landscape mode. All of the output programs can be run with looping programs which sequentially execute the program for all countries/regions in a model (e.g. DEMOLOOP SOUT X P).

In addition to SOUT, there are a number of other output programs (TABLE, COMPARE, etc) that facilitate analysis (58). The simplicity of output programming, with DOS batch programs and spreadsheet templates, allows the user to customize output.

Concluding Comments

This report gives a potential user an overview of the SWOPSIM modeling framework from an theoretical and practical viewpoint. The reader should also consult publications presenting analysis with SWOPSIM models to best understand what can be done with the framework. The experience of many users has been that, since the framework is worth having and using for enough types of analytical problems, it should be added to the operational tool kit of the applied economist. SWOPSIM models do not do everything; for example, they are not general equilibrium nor dynamic in nature. But they can provide proximate answers to a surprising variety of problems in economics. After all, the default models are simply a form of quantification of the basic tool of the economist, supply and demand analysis.

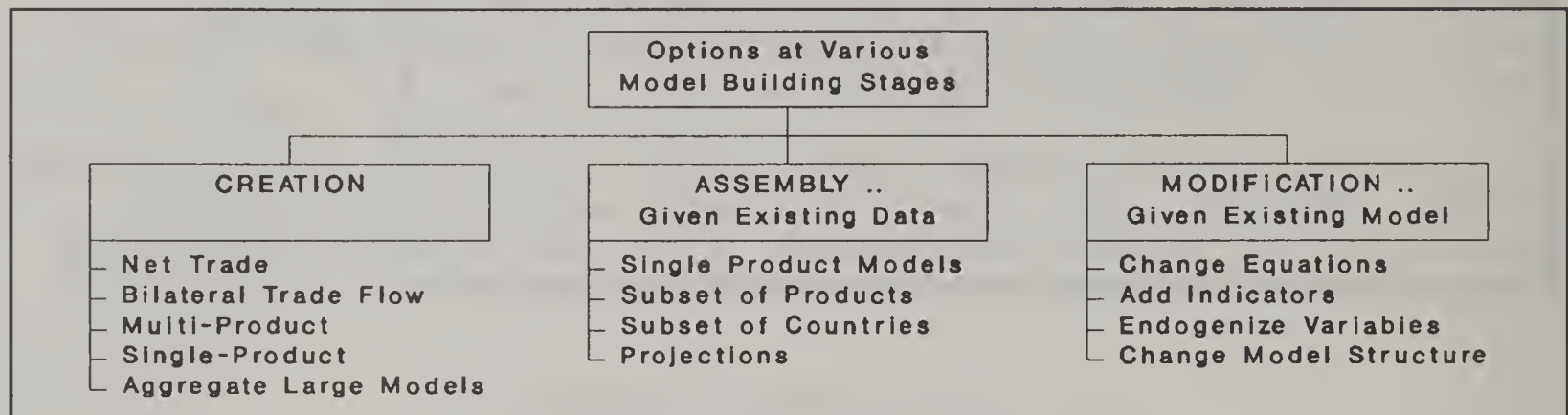
Conducting Sensitivity Analyses

A good research/analytical strategy is to do sensitivity analysis with a base period model. Confidence in a model and judgement of the "reasonableness" of results is gained by simulating a model under a wide range of driving assumptions and model parameters. If one is studying the effects of quantity shocks, this can be done directly without reinitializing the model. If, on the other hand, experiments require the alteration of elasticities or some other data that would change the equation constants, then modifications will have to be made in the country spreadsheet. In this case, EQUATION must be re-run to re-initialize the country spreadsheet where changes were made, and a new world model must be rebuilt. If base data is changed, WORK must be used to recalculate the support spreadsheet, SUPPORT must be used to update the model spreadsheet, and then EQUATION and WORLDMOD must be run. Typical errors arise because the user fails to follow this systematic procedure.

Modifications to the Default Model

The basic SWOPSIM modeling framework provides options to modify standard models to suit different research needs. Figure 1 outlines SWOPSIM options at various stages of the model building process. Choices can be made at the model creation stage. Dixit

Figure 1--SWOPSIM Options



and Roningen (10) altered the framework to allow for bilateral trade-flows (6) between countries in their study of the U.S.-Canada free trade area (using the Armington assumption). This option is now available in the model creation process. Researchers can widen or narrow the focus of a model by defining the product coverage in the creation process. Krissoff and Ballenger (38) used the framework to incorporate a nonagricultural sector and studied the implications of agricultural policy changes under endogenous exchange rates. Mabbs-Zeno and Krissoff (47,48,49,50) used the basic framework to study liberalization in the tropical products market.

When country model spreadsheets have been created, supporting data have been entered, and model equations have been initialized, several options are available for the assembly of a world model. Single or multiple product world models can be assembled. In addition, world models can be assembled with subsets of the global product and country mix by selecting options that substitute fixed numbers for equations. This procedure, in effect, holds values of selected country and product variables constant in a world model simulation.

Finally, once country models have been created in spreadsheets or a world model has been assembled in a three-dimensional spreadsheet, contents of a spreadsheet can be modified manually by the user. Care must be taken not to subvert the functioning of a model, but the complete flexibility of the spreadsheet is generally available to the user for model modification.

Because SWOPSIM models and data reside in spreadsheets, the framework and resulting models are very flexible and can be modified to suit various research needs. The only limitation is the imagination of the researcher.

References

1. Andrews, Neil, Bruce Bowen, H. Don B.H. Gunasekera, Henry Hasler, and Heather Field. Some Implications of Rebalancing EC Agricultural Protection, Discussion Paper 90.5, Australian Bureau of Agricultural and Resource Economics, Canberra, May 1990.
2. Blandford, David, Harry de Gorter, Praveen Dixit, and Steve Magiera. "Agricultural Trade Liberalization and Multilateral Stake in Agricultural Policy Reform," Agricultural Policies in a New Decade, Kris Allen, (ed), Resources for the Future, Washington, DC, Mar. 1990.
3. Cochrane, Nancy. "The Longer Term Effects of Major Policy Reform on Poland's Agricultural Production and Trade," paper presented at joint OECD and Governments of Denmark and Poland Conference, Agriculture in the East and West: The Polish Case, Copenhagen, Mar. 1990.
4. Cochrane, Nancy. Trade Liberalization in Yugoslavia and Poland, Staff Report AGES 9058, Econ. Res. Serv., U.S. Dept. Agr., Aug. 1990.
5. Cook, Edward. "Economic Restructuring in the USSR and Its Potential Impact on Agricultural Trade," World Agriculture Situation and Outlook Report Special Issue: Forces for Change in the 1990's, WAS-59, Econ. Res. Serv., U.S. Dept. Agr., June 1990.
6. Dixit, Praveen, and Vernon Roningen. Modeling Bilateral Trade Flows with the Static World Policy Simulation (SWOPSIM) Modeling Framework, Staff Report AGES861124, Econ. Res. Serv., U.S. Dept. Agr., Dec. 1986.
7. Dixit, Praveen, Vernon Roningen, John Sullivan, and John Wainio. "The Impact of the Removal of Support to Agriculture in Developed Countries," paper presented at the International Agricultural Trade Consortium meetings, Warrenton, VA, Dec. 1987.
8. Dixit, Praveen, Michael Herlihy, and Steven Magiera. "Global Implications of Agricultural Trade Liberalization," Agricultural Food Policy Review: U.S. Agricultural Policies in a Changing World, AER-620, Econ. Res. Serv., U.S. Dept. Agr., Nov. 1989.
9. Dixit, Praveen, and Shwu-Eng Webb. "Government Support to Agriculture in China: Effects on World Markets," paper presented at the Assoc. of Comparative Economics Studies panel, Allied Social Science Convention, Atlanta, GA, Dec. 1989.
10. Dixit, Praveen, and Vernon Roningen. "Quantitative Implications of Creating an Agricultural Free Trade Area between the U.S. and Canada," Canadian Journal of Agricultural Economics, Vol. 37, Dec. 1989.
11. Dykes, Nancy, and Glenn C.W. Ames. "The Impact of the Canada-U.S. Free Trade Agreement on Southeastern Farm Income,"

paper presented at the Southern Agricultural Economics Assoc. meetings, Little Rock, AR, Feb. 1990.

12. Gardiner, Walter, Vernon Roningen, and Karen Liu. Elasticities in the Trade Liberalization Database, Staff Report AGES 89-20, Econ. Res. Serv., U.S. Dept. Agr., May 1989.

13. Ginzel, John, and Barry Krissoff. "An Assessment of the Economic Effects of a Ban on Beef Trade," Economic Impact of the European Economic Community's Ban on Anabolic Implants, Food Safety and Inspection Serv., U.S. Dept. Agr., Oct. 1987.

14. Glecker, James, and Luther Tweeten. "The Economic Impact of a U.S.-Japan Free Trade Agreement," The Asian Market for Agricultural Products, Ohio State Univ., Columbus, OH, 1990.

15. Glecker, James, and Luther Tweeten. "The Estimated Economic Impact of Alternative Levels of Harmonized Farm Commodity Price Supports in the European Community," ESO #1706, Ohio State Univ., Columbus, OH, 1990.

16. Glecker, James, and Luther Tweeten. "The Estimated Economic Impact of Alternative Levels of Harmonized Farm Commodity Price Supports in the European Community," NC-194 Occasional Paper 11, Ohio State Univ., Columbus, OH, May 1990.

17. Glecker, James, and Luther Tweeten. "Benefits to U.S. Agriculture from Terminating European Oilseed Subsidies," NC-194 Occasional Paper OP-14, Ohio State Univ., Columbus, OH, July 1990.

18. Gunasekera, Don, Bruce Bowen, and Neil Andrews. "Developing Country Debt: Implications for Growth and Agricultural Trade," paper presented at the Conference for Economists, Economic Society of Australia, Univ. of Adelaide, Canberra, July 1989.

19. Haley, Stephen, and Praveen Dixit. Economic Welfare Analysis: An Application to the SWOPSIM Modeling Framework, Staff Report AGES871215, Econ. Res. Serv., U.S. Dept. Agr., Aug. 1988.

20. Haley, Stephen. Joint Products in the Static World Policy Simulation (SWOPSIM) Modeling Framework, Staff Report AGES881024, Econ. Res. Serv., U.S. Dept. Agr., Nov. 1988.

21. Haley, Stephen. Using Producer and Consumer Subsidy Equivalents in the SWOPSIM Modeling Framework, Staff Report AGES 89-11, Econ. Res. Serv., U.S. Dept. Agr., Mar. 1989.

22. Haley, Stephen. "Calculating Consumer Welfare Gains Resulting from Trade Liberalization in Centrally Planned Economies," unpublished, May 1989.

23. Haley, Stephen, Michael Herlihy, and Brian Johnston. "Assessing Model Assumptions in Trade Liberalization Modeling: An Application to SWOPSIM," paper presented at the Southern

Agricultural Economics Assoc. meetings, Little Rock, AR, Feb. 1990.

24. Haley, Stephen. Measuring the Effectiveness of the Export Enhancement Program for Poultry, Staff Report AGES 90-16, Econ. Res. Serv., U.S. Dept. Agr., Mar. 1990.

25. Haley, Stephen, Michael Herlihy, and Brian Johnston. "Estimating Trade Liberalization Effects for U.S. Grains and Cotton," unpublished, Econ. Res. Serv., U.S. Dept. Agr., Apr. 1990.

26. Haley, Stephen, Peter Riley, Mark Smith, and Karen Ackerman. "Analysis of the Export Enhancement Program for Barley," unpublished, Econ. Res. Serv., U.S. Dept. Agr., Apr. 1990.

27. Herlihy, Michael, Stephen Haley, and Brian Johnston. "Assessing Model Assumptions in Trade Liberalization Modeling: An Application to SWOPSIM," unpublished, Econ. Res. Serv., U.S. Dept. Agr., forthcoming.

28. Hsiou, Li-Fang. "An Analysis of Removal of Agricultural Trade Barriers Between the U.S.A. and Canada with Emphasis on the Southeast," masters thesis, Univ. of Georgia, 1989.

29. International Monetary Fund. International Financial Statistics, various issues.

30. Johnston, Brian, Barry Krissoff, Vernon Roningen, John Sullivan, and John Wainio. "Economic Effects of Agricultural Trade Liberalization on Developing Countries," background paper for International Agricultural Trade Research Consortium Symposium on "Bringing Agriculture into the GATT," Annapolis, MD, Aug. 1988.

31. Kane, Sally, John Reilly, and Rhonda Bucklin. "Implications of the Greenhouse Effect for World Agricultural Commodity Markets," paper presented at the Western Economic Assoc. Conference, Lake Tahoe, CA, June 1989.

32. Kirby, Michael, Henry Haszler, David Parsons, and Michael Adams. Early Action on Agricultural Trade Reform: Application and Effects, Discussion Paper 88.3, Australian Bureau of Agricultural and Resource Economics, Canberra, June 1988.

33. Koopman, Robert, Edward Cook, and William Liefert. "Soviet Support to Agriculture: Its Measurement and Impact on World Markets - A Preliminary Analysis," paper presented at American Assoc. for the Advancement of Slavic Studies meetings, Honolulu, HI, Nov. 1988.

34. Koopman, Robert, William Liefert, and Edward Cook. "The Effects of Soviet Agricultural Policy on World Markets," paper presented at Allied Social Science meetings, Atlanta, GA, Dec. 1989.

35. Krissoff, Barry, and Nicole Ballenger. Effects of Protection and Exchange Rate Policies on Agricultural Trade: Implications for Argentina, Brazil, and Mexico, Staff Report AGES870825, Econ. Res. Serv., U.S. Dept. Agr., Sept. 1987.
36. Krissoff, Barry, John Sullivan, and John Wainio. "Opening Agricultural Markets: Trade and Welfare Implications for Developing Countries," Paper presented at Inter-American Development Bank, Washington, DC, Aug. 1989.
37. Krissoff, Barry, John Sullivan, and John Wainio. "Agricultural Trade Liberalization and Developing Countries," Developing Economies Agriculture and Trade Report, RS-89-4, Econ. Res. Serv., U.S. Dept. Agr., Aug. 1989.
38. Krissoff, Barry, and Nicole Ballenger. "Agricultural Trade Liberalization in a Multi-Sector World Model," Agricultural Economics, Vol. 3, 1989, pp. 83-98.
39. Krissoff, Barry, and Nicole Ballenger. "Agricultural Trade Liberalization in a Multi-Sector World Model: Implications for Argentina, Brazil, and Mexico," Government Intervention in Agriculture: Cause and Effect, Bruce Greenshields and Margot Bellamy, (eds), IAAE Occasional Paper No. 5, Gower House, UK, 1989.
40. Krissoff, Barry, John Sullivan, and John Wainio. "GATT and Agricultural Policy Reform: Implications for Developing Countries," Paper presented at the UNCTAD seminar on "Agricultural Trade Models for Analysts from Developing Countries," Geneva, Nov. 1989.
41. Krissoff, Barry, John Sullivan, and John Wainio. "Opening Agricultural Markets: Implications for Developing Countries," Canadian Journal of Agricultural Economics, Vol. 37, Dec. 1989.
42. Krissoff, Barry, John Sullivan, and John Wainio. "Developing Countries in an Open Economy: The Case of Agriculture," Agricultural Trade Liberalization: Implications for Developing Countries, Ian Goldin and Odin Knudson, (eds), OECD and the World Bank, Washington, DC, May 1990.
43. Krissoff, Barry, John Sullivan, John Wainio, and Brian Johnston. Agricultural Trade Liberalization and Developing Countries, Staff Report AGES 9042, Econ. Res. Serv., U.S. Dept. Agr., May 1990.
44. Liapis, Peter. Incorporating Inputs In the Static World Policy Simulation Model (SWOPSIM), TB-1789, Econ. Res. Serv., U.S. Dept. Agr., June 1990.
45. Liefert, William, Edward Cook, and Robert Koopman. "World Agricultural Trade Liberalization and the USSR," paper presented at the American Assoc. for the Advancement of Slavic Studies meetings, Chicago, IL, Nov. 1989.

46. Liefert, William, and Edward Cook. "Modeling Soviet Agricultural Trade Liberalization," USSR Agriculture and Trade Report, RS-90-1, Econ. Res. Serv., U.S. Dept. Agr., May 1990.
47. Mabbs-Zeno, Carl, and Barry Krissoff. "Implications for Africa of Trade Liberalization in Tropical Beverages," Paper presented at the African Studies Assoc. meetings, Atlanta, GA, Nov. 1989.
48. Mabbs-Zeno, Carl, and Barry Krissoff. "Implications for Developing Countries of Policy Liberalization in Tropical Beverages," Paper presented at the UNCTAD seminar on "Agricultural Trade Models for Analysts from Developing Countries," Geneva, Nov. 1989.
49. Mabbs-Zeno, Carl, and Barry Krissoff. "Does Trade Liberalization in Tropical Beverages Improve Export Revenues?" World Agriculture Situation and Outlook Report, WAS-57, Econ. Res. Serv., U.S. Dept. Agr., Dec. 1989, pp. 27-30.
50. Mabbs-Zeno, Carl, and Barry Krissoff. "Tropical Beverages in the GATT," Agricultural Trade Liberalization: Implications for Developing Countries, Ian Goldin and Odin Knudson, (eds), OECD and the World Bank, Washington, DC, May 1990.
51. Magiera, Steven, and Michael Herlihy. "Comparing World Price Changes from Trade Liberalization Models," Background paper for International Agricultural Trade Research Consortium Symposium on "Bringing Agriculture into the GATT," Annapolis, MD, Aug. 1988.
52. Magiera, Steven, and Praveen Dixit. "Decoupling Agricultural Support," Paper presented at the American Agricultural Economics Assoc. meetings, Baton Rouge, LA, Aug. 1989.
53. Mukendi, Yampulu. "An Econometric Analysis of Agricultural Policy in Zaire with Emphasis on Trade with Developed Countries," Masters thesis, Univ. of Georgia, 1989.
54. Neff, Liana. "1990 Farm Bill and Developing Countries," Paper presented at the American Agricultural Economics Assoc. meetings, Vancouver, Aug. 1990.
55. Organization for Economic Cooperation and Development (OECD). National Policies and Agricultural Trade. Paris, 1987.
56. Riethmuller, Paul, Ivan Roberts, L. Paul O'Mara, Graeme Tie, Vivek Tulpule, Moazzem Hossain, and Nico Klijn. Proposed Strategies for Reducing Agricultural Protection in the GATT Uruguay Round: A Synthesis and Assessment, Discussion Paper 90.6, Australian Bureau of Agricultural and Resource Economics, Canberra, May 1990.

57. Roningen, Vernon. A Static World Policy Simulation (SWOPSIM) Modeling Framework, Staff Report AGES860625, Econ. Res. Serv., U.S. Dept. Agr., July 1986.
58. Roningen, Vernon, Praveen Dixit, Tracy Hart, and John Sullivan. "Documentation of the Static World Policy Simulation (SWOPSIM) Modeling Framework," Econ. Res. Serv., U.S. Dept. Agr., forthcoming.
59. Roningen, Vernon, John Sullivan, and John Wainio. "The Liberalization of Agricultural Support in the United States, Canada, the European Community, and Japan," Paper presented at the GATT Agricultural Policy Modeling Workshop, London, Ontario, Canada, May 1987.
60. Roningen, Vernon, John Sullivan, and John Wainio. "The Impacts of Liberalizing Agricultural Trade in Developed Countries," Paper presented at the American Agricultural Economics Assoc. meetings, East Lansing, MI, Aug. 1987.
61. Roningen, Vernon, and Praveen Dixit. Economic Implications of Agricultural Policy Reforms in Industrial Market Economies, Staff Report AGES 89-36, Econ. Res. Serv., U.S. Dept. Agr., Aug. 1989.
62. Roningen, Vernon, and Praveen Dixit. How Level is the Playing Field?: An Economic Analysis of Agricultural Policy Reforms in Industrial Market Economies, FAER-239, Econ. Res. Serv., U.S. Dept. Agr., Dec. 1989.
63. Roningen, Vernon, and Praveen Dixit. "Agricultural Policy Reform: The Case of Japan," Journal of Asian Economics, Spring 1991, forthcoming.
64. Roningen, Vernon, and Praveen Dixit. "Assessing the Implications of Freer Agricultural Trade," Food Policy, Vol. 15, Feb. 1990, pp. 67-75.
65. Roningen, Vernon, Praveen Dixit, and Ralph Seeley. "Agricultural Outlook in the Year 2000: Some Alternatives," Agriculture and Governments in an Interdependent World, Allan Maunder and Alberto Valdes, (eds), Dartmouth Pub. Co., England, 1990.
66. Schwartz, Nancy, and Barry Krissoff. How Strategies to Reduce U.S. Bilateral Trade Deficits in Manufactures Affect U.S. Agricultural Exports, Staff Report AGES871005, Econ. Res. Serv., U.S. Dept. Agr., Oct. 1987.
67. Schwartz, Nancy, and Barry Krissoff. "Strategies for Trade in Manufactures and Agricultural Trade Impacts," Government Intervention in Agriculture: Cause and Effect, Bruce Greenshields and Margot Bellamy (eds), IAAE Occasional Paper No. 5, Gower House, UK, 1989.

68. Sullivan, John, Vernon Roningen, and John Wainio. "The Impacts on World Dairy Markets from Removal of Support to Agriculture in the Developed Economies," paper presented at the Northeast Agricultural Economics Assoc. meetings, Kingsport, RI, June 1987.
69. Sullivan, John, John Wainio, and Vernon Roningen. A Database for Trade Liberalization Studies, Staff Report AGES 89-12, Econ. Res. Serv., U.S. Dept. Agr., Mar. 1989.
70. Sullivan, John. Price Transmission Elasticities in the Trade Liberalization (TLIB) Database, Staff Report AGES 9034, Econ. Res. Serv., U.S. Dept. Agr., Apr. 1990.
71. Tyers, R., and K. Anderson. "Distortions in World Food Markets: A Quantitative Assessment," Background paper for the World Bank's World Development Report, Washington, DC, July 1986.
72. U.S. Department of Agriculture (USDA), Economic Research Service. Estimates of Producer and Consumer Subsidy Equivalents: Government Intervention in Agriculture, 1982-87. SB-803, Apr. 1990.
73. U.S. Department of Agriculture (USDA), Economic Research Service. Government Intervention in Agriculture: Measurement, Evaluation, and Implications for Trade Negotiations. FAER-229, 1987.
74. Wainio, John, Vernon Roningen, and John Sullivan. "The Impact of the Removal of Support to Agriculture - Implications for the South," Paper presented at the Southern Agricultural Economics Assoc. meetings, New Orleans, LA, Feb. 1988.
75. Webb, Alan, Vernon Roningen, and Praveen Dixit. "Analyzing Agricultural Trade Liberalization for the Pacific Basin," Proceedings of the Second Workshop of the Livestock and Grains Study Programme of the Pacific Economic Cooperation Conference, Centre for Agricultural Policy Studies, Massey Univ., Palmerston North, New Zealand, Oct. 1988.
76. Webb, Alan, and Praveen Dixit. "GATT Compatibility of the 1990 Farm Bill," Paper presented to the Task Force on Agricultural Policy, Trade, and Development Workshop, Seoul, South Korea, May 1989.
77. Webb, Alan, Praveen Dixit, and Howard Conley. "GATT and the 1990 Farm Bill: Compatibility or Confrontation?" American Journal of Agricultural Economics, Vol. 71, Dec. 1989.

Appendix A--Country Policy Support Spreadsheet--DEMOSUS

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	DEMOSUS	Policy	Support	Worksheet	Exchange	Rate	(Local	Currency	U.S.\$)					
2	Base Year	1989					Local	Currency	Unit	US\$				
3	12/13/90	Model	Base	Data	S.-D.=	Producer	GROSS	GROSS	EX-IM=	DIFF.	Domestic	Currency	Prices	
4		(US\$/MT)	1000	MT	NTRADE	Share C.	EXPORTS	IMPORTS	NTRADE	IN	(Local	Currency / MT)		
5	US	WDPRICE	SUPPLY	DEMAND		PRSHARE				NTRADE	MKPRICE	PRIPRICE	CNIPRICE	DTDPRICE
7	BF	2567	10655	11160	-505	.55	482	987	-505		2504	2523	4539	2460
8	PK	2176	7176	7461	-285	.50	122	407	-285		1290	1290	2576	1290
9	ML	2321	157	182	-25	.50	2	27	-25		2394	2394	4788	2381
10	PM	1039	9984	9558	426	.55	426		426		1113	1121	2015	1103
11	PE	1696	4104	4031	73	.60	83	10	73		1150	1150	1909	1140
12	DW	272	65432	65432		.50					301	301	595	260
13	DB	2866	572	506	66	.80	68	2	66		2820	2820	3376	2026
14	DC	3009	2531	2649	-118	.70	7	125	-118		3060	3060	4229	2199
15	DP	2326	395	251	144	.80	145	1	144		2326	2326	2720	1671
16	WH	169	55406	22486	32920	.70	33557	637	32920		140	159	198	135
17	CN	111	191198	131556	59642	.90	59693	51	59642		89	115	99	89
18	CG	105	30245	22397	7848	.90	9208	1360	7848		82	108	91	82
19	RI	320	5010	2675	2335	.50	2497	162	2335		223	329	438	223
20	SB	275	52439	35665	16774	.95	16874	100	16774		203	205	214	203
21	SW	247	24518	20119	4399	.80	4404	5	4399		170	170	212	170
22	SO	431	5743	5086	657	.50	680	23	657		452	452	904	452
23	OS	630	6900	6642	258	.90	607	349	258		119	119	132	119
24	OW	200	2242	2487	-245	.80	131	376	-245		185	185	231	185
25	OO	774	1068	1612	-544	.50	435	979	-544		441	441	882	441
26	CT	1674	2655	957	1698	.50	1698		1698		1270	1647	2540	1270
27	SU	282	6089	7379	-1290	.50	463	1753	-1290		356	357	712	250
28	TB	3844	559	514	45	.50	225	180	45		3583	3583	7166	3583
30														
31														
32														
33														
34														
35														
36														
37	US													
38														
39	BF	19	14		-44		.8	.3	-1.8		2504	2523	4539	2460
40	PK		4					.1			1290	1290	2576	1290
41	ML				-13						2394	2394	4788	2381
42	PM	8	8	10			.7	.4	.9		1113	1121	2015	1103
43	PE		8	10				.4	.9		1150	1150	1909	1140
44	DW	41	-34				13.5	-5.7			301	301	595	260
45	DB		149	794				4.4	39.2		2820	2820	3376	2026
46	DC	861	-719				28.1	-17.0			3060	3060	4229	2199
47	DP		188	655				6.9	39.2		2326	2326	2720	1671
48	WH	19	2	5			11.7	1.2	3.7		140	159	198	135
49	CN	26					22.3	.1			89	115	99	89
50	CG	26					24.3				82	108	91	82
51	RI	106	8				32.2	1.9			223	329	438	223
52	SB	2					.7	.1			203	205	214	203
53	SW										170	170	212	170
54	SO										452	452	904	452
55	OS										119	119	132	119
56	OW										185	185	231	185
57	OO										441	441	882	441
58	CT	377					22.9				1270	1647	2540	1270
59	SU	106	-106				29.8	-14.9			356	357	712	250
60	TB										3583	3583	7166	3583

[illegible]

Appendix A--Country Policy Support Spreadsheet--DEMOsUS--continued

[illegible]

	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD
1	DEMO	SUS	Commodity Programs				Export Support (subsidies + taxes -) in Local Currency				Other Programs			
2														
3	12/13/90													
4														
5	US													
6														
7	BF													
8	PK													
9	ML													
10	PM													
11	PE													
12	DW													
13	DB													
14	DC													
15	DP													
16	WH													
17	CN													
18	CG													
19	RI													
20	SB													
21	SW													
22	SO													
23	OS													
24	OW													
25	OO													
26	CT													
27	SU													
28	TB													
29														
30	SUM													
31														
32														
33														
34														
35														
36														
37	US													
38	SUM-->													
39	BF													
40	PK													
41	ML													
42	PM													
43	PE													
44	DW													
45	DB													
46	DC													
47	DP													
48	WH													
49	CN													
50	CG													
51	RI													
52	SB													
53	SW													
54	SO													
55	OS													
56	OW													
57	OO													
58	CT													
59	SU													
60	TB													

Appendix A--Country Policy Support Spreadsheet--DEMOSUS--continued

Model Prices in US (US price units)										US PRICE UNIT		PSE
WOPRICE	WOPRICE	WOPRICE	WOPRICE	WOPRICE	WOPRICE	WOPRICE	WOPRICE	WOPRICE	WOPRICE	WOPRICE	WOPRICE	WOPRICE
116.44	113.58	114.44	205.88	114.44	\$/CWT	2.86						
98.70	58.51	58.51	116.86	58.51	\$/CWT							
105.28	108.59	108.59	217.18	108.59	\$/CWT	.60						
47.13	50.48	50.85	91.41	50.85	CENTS/LB	.8						
120.8	81.9	81.9	135.9	81.9	CENTS/DZ	.7						
12.34	13.65	13.65	27.00	13.65	\$/CWT	1.84						
130.0	127.9	127.9	153.1	127.9	CENTS/LB	36.0						
136.5	138.8	138.8	191.8	138.8	CENTS/LB	39.1						
105.5	105.5	105.5	123.4	105.5	CENTS/LB	29.7						
4.60	3.81	4.31	5.38	4.31	\$/BU	.64						
2.82	2.26	2.91	2.51	2.91	\$/BU	.65						
2.67	2.08	2.75	2.31	2.75	\$/BU	.67						
14.51	10.12	14.92	19.85	14.92	\$/CWT	4.80						
7.48	5.52	5.57	5.81	5.57	\$/BU	.04						
247.00	170.00	170.00	212.50	170.00	\$/MT							
19.5	20.5	20.5	41.0	20.5	CENTS/LB							
630.00	119.00	119.00	132.22	119.00	\$/MT							
200.00	185.00	185.00	231.25	185.00	\$/MT							
35.1	20.0	20.0	40.0	20.0	CENTS/LB							
75.9	57.6	74.7	115.2	74.7	CENTS/LB	17.1						
12.8	16.1	16.2	32.3	16.2	CENTS/LB	4.8						
1.74	1.63	1.63	3.25	1.63	\$/LB							

[illegible]

		Summary Table				195					
	12/12/50	Support PSF	Measures CSF	Value -Prod	Share of -Cons.	Share of Produc. Support	Share of Agric Budget	Source of Consumer Transfer	Producer PS	Support Calculation IS	MS
32	Beef & mutton	2 5	- 7	19 7	25 6	4 3	3 1	48	30		70
33	Pork		- 1	6 7	9 5		3				
34	Poultry meat & eggs	1 4	- 1	11 5	13 4	1 4	1 9	11	29	87	
35	Milk	13 5	-5 7	14 4	19 3	16 9	4 3	83	100		
36	Dairy products	23 1	-17 3	7 5	6 7	18 4	6 4	82	81	65	
37	Wheat	14 9	-1 4	5 7	2 2	8 3	12 2	12	79	21	
38	Corn	22 3	1	12 4	6 4	31 1	47 9		100		
39	O. coarse grains	24 3		1 8	1 0	5 1	7 6		100		
40	Rice	32 2	1 9	7 8	3 6	3 4	5 4		100		
41	Soybeans	7	1	7 8	3 8	5	8		100		
42	Soybean oil & meal			4 9	4 4						
43	Other oilseeds			6	4						
44	Other meals & oil			6 6	1 0						
45	Cotton	22 9		2 5	1 2	6 4	9 8		100		
46	Sugar	29 8	-14 9	1 6	2 6	4 1		99	100		
47	Tobacco			1 8	1 8						

Appendix 2--Country Policy Support Spreadsheet--DEMOsUS--concluded

[illegible]

Crops	Summary Table		US		Share of		Source of Producer Support		PSE Calculation	
	Support PSE	Measures CSE	Value Prod	Share of Cons	Product Support	Agric. Budget	Consumer Transfer	PS	ES	MS
All Crops	1.1	-1.3	38.0	48.5	5.7	5.3	28	24	26	36
Food Crops	1.5	-1.1	21.6	26.1	35.3	10.7	83	94	22	
Feed Crops	11.8		16.5	2.8	11.7	17.7	10	81	19	
Non-Food & Non-Feed Crops	1.4		13.6	6.6	5	8		56		
Food & Feed Crops	12.8	-1.0	5.5	5.6	10.5	9.8	29	73		

Summary Table US											0.39
	Support PSE	Measures CSE	Value -Prod	Share of -Cons	Share of Product. Support	Share of Agric. Budget	Source of Consumer Transfer	Source of PSE Calculation PS	Producer Support ES	Support MS	0.05
1980-81	7.8	-3.3	50.0	74.5	41.1	16.0	48	50	25	23Sh.Crush.	
1982-83	7.5	-1.6	40.1	25.5	58.9	64.0	6	78	3		0.1

Summary Table		US		-----Share of-----Source of Producer Support-----						
	SUPPORT PSE	MEASURES CSE	Value -Prod	share of -Cons	Produc. Support	Agric. Budget	Consumer Transfer	-----PSE Calculation-----	ES	MS
12-13-1981										
1981 products	71.4	-2.8	100.0	100.0	100.0	100.0	31	61	16	14

	DA	DB	DC	DD	DE	DF	DG	DH	
	Supply	Demand	Market	Market	Direct	Offset	Dir. o.	Quantity	
	Elas.	Elas.	Support	Support	Support	from	Support	Trade	
	Producers	Producers	Producers	Producers	Producers	Set-side	Consumer	Distort.	
	US\$	US\$	-Quantity	Trade	Distorted	by support	(QTD)	(1000 MT)-	
1973	673	-339	55	-72	103	141	45	44	333
1974	2	-2	92	-81	1	1	17	17	2
1975	181	-16	75	-86	68	62	54	52	237
1976	40	-8	68	-28	24	10	8	41	41
1977	2651	-2208	58	-17	5109	1497	250	6856	147
1978	454	-326	40	-49	64	70	13	147	739
1979	2180	-1905	44	-49	313	365	60	9	72
1980	259	-117	27	-46	30	33	4255	-4733	197
1981	1307	-62	58	-53	1160	430	26895	-13012	61
1982	4885	7	49	-78			5906	-3346	2560
1983	764		61	-85			1118	-1103	29
1984	531	22	47	-29			233		10
1985	80	4	59	-50					
1986			30	-90					
1987			16	-43					
1988			66	-61					
1989			12	-100					
1990			29	-56					
1991	1900		67	-35			528	-266	262
1992	648	-781	41	-38	742	834	4		1579
1993			23	-35					

	Model	Market support if	Quant	Export	Import	Market Support Producer	Market Support Consumer	Direct Support Producer	Offset from Set-side by support	Dir. O. Support Consumer (VTD)	Quantity Trade Distort.
				Subs.	Tax	--value of--	of Trade	Distorted			(M US\$)--
				-----Local Currency-----		Total-->	3370	2536	5801	-3393	8892
						BF	265	363	114		855
						PK				113	37
						ML	2	2			3
						PM	70	65	56		246
						PE	40	16			69
						DW	1390	407			1865
						DB	185	200			422
						DC	943	1099			2224
						DP	70	76			167
						WH	196	73			221
						CN			719	-800	1548
						CG			2985	-1444	269
						RI			620	-351	14
						SF			358	-353	67
						SO			64		
						OS					
						OW					
						OQ					
						CT			883	-444	439
						SU			1		445
						TB	209	235			

Appendix B--Country Model Spreadsheet--DEMObUS

	I	A	I	B	I	C	I	D	I	E	I	F	I	G	I	H	I	I	I	J	I	K	I	L	I	M	I	N	I
		DEMOMBUS		1989		XRATE-(LC/US\$)->						12/13/90				TRANSMISS.-ELAS.->								INCROW->		.018			
1																													
2																													
3		SUPPLY-EL		BF		PK		ML		PM		PE		DM		DB		DC		DP		WH		CN		CG		RI	
4				.60		-.01		.00		.00		.00		.02								-.00		-.06		-.01			
5				PK		-.03		1.00		.00		-.01		.00		.00						-.01		-.35		-.06			
6				ML		.00		.00		.80		.00		.00		.00						.00		-.03		-.02			
7				PM		.00		-.01		.00		.65		-.02		.00						-.02		-.08		-.01			
8				PE		.00		.00		.00		-.05		.55		.00						-.02		-.12		-.02			
9				DM		.03		.00		.00		.00		.50								-.00		-.05		-.01			
10				DB										-.16		.55		-.65		.31									
11				DC										-.16		-.14		.42		-.08									
12				DP										-.16		.55		-.65		.31									
13				WH																		.60		-.25		-.06		.00	
14				CN																		-.10		.48		-.06		.00	
15				CG																		-.15		-.40		.99		.00	
16				RI																		.00		.00		.00		.40	
17				SB																		.04		-.14		-.03		.00	
18				SM																									
19				SO																									
20				OS																		-.11		.00		-.12		.00	
21				OW																									
22				OO																									
23				CT																		.00		.00		.00		.00	
24				SU																		-.04		.00		.00		.00	
25				TB																		.00		.00		.00		.00	
26																													
27		DEMAND-EL		BF		PK		ML		PM		PE		DM		DB		DC		DP		WH		CN		CG		RI	
28				BF		-.70		.05		.03		.00		.00		.00		.00		.00		.00		.00		.00		.00	
29				PK		.13		-.86		.03		.00		.00		.00		.00		.00		.00		.00		.00		.00	
30				ML		.00		.18		-.70		.00		.00		.00		.00		.00		.00		.00		.00		.00	
31				PM		.08		.03		.00		-.56		.00		.00		.00		.00		.00		.00		.00		.00	
32				PE		.00		.00		.00		-.35		.00		.00		.00		.00		.00		.00		.00		.00	
33				DM		.00		.00		.00		.00		-.16		.01		.03		.00		.00		.00		.00		.00	
34				DB		.00		.00		.00		.00				-.63		.00		.00		.00		.00		.00		.00	
35				DC		.00		.00		.00		.00				.00		-.60		.00		.00		.00		.00		.00	
36				DP		.00		.00		.00		.00				.00		.00		-.65		.00		.00		.00		.00	
37				WH		.00		.00		.00		.00		.00		.00		.00		.00		-.49		.15		.04		.00	
38				CN		.00		.00		.00		.00		.00		.00		.00		.00		.05		-.80		.10		.00	
39				CG		.00		.00		.00		.00		.00		.00		.00		.00		.09		-.64		-1.38		.00	
40				RI		.00		.00		.00		.00		.00		.00		.00		.00		.00		.00		.00		-.25	
41				SB		.00		.00		.00		.00		.00		.00		.00		.00		.00		.00		.00		.00	
42				SM		.00		.00		.00		.00		.00		.00		.00		.00		.00		.06		.00		.00	
43				SO		.00		.00		.00		.00		.00		.00		.00		.00		.00		.00		.00		.00	
44				OS		.00		.00		.00		.00		.00		.00		.00		.00		.00		.00		.00		.00	
45				OW		.00		.00		.00		.00		.00		.00		.00		.00		.00		.23		.04		.00	
46				OO		.00		.00		.00		.00		.00		.00		.00		.00		.00		.00		.00		.00	
47				CT		.00		.00		.00		.00		.00		.00		.00		.00		.00		.00		.00		.00	
48				SU		.00		.00		.00		.00		.00		.00		.00		.00		.00		.02		.00		.00	
49				TB		.00		.00		.00		.00		.00		.00		.00		.00		.00		.00		.00		.00	

	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1	POP	GROW-->	.00758	INCOME (M.US\$)->	4466515	courtesy of	vernon oley	POPUL (1000)-->	247132					
2				A SWOP	SIM model			Ron	ingen					
3	SB	SM	SO	OS	OM	OO	CT	SU	TB	SUPSUM	S-DSUM	TCOLSUM		
4		-.01			-.00					.52	1.14	.3		
5		-.14			-.02					.37	1.06	.3		
6		.00			.00					.75	1.27	.3		
7		-.09			-.01					.41	.86	.3		
8		-.06			-.01					.27	.62	.3		
9		-.01			-.00					.45	.57	.3		
10										.05	.68	.3		
11										.05	.65	.3		
12										.05	.70	.3		
13	.05			-.01			.00	-.01	.00	.33	.62	.3		
14	-.07			.00			.00	.00	.00	.25	.86	.3		
15	-.09			-.03			.00	.00	.00	.32	.96	.3		
16	.00			.00			.00	.00	.00	.40	.65	.3		
17	.60			.00			-.11	.00	-.01	.35	.40	.3		
18	-.27	.20	.12							.05	.78	.3		
19	-.27	.20	.12							.05	.27	.3		
20	.00			.55			-.08	.00	.00	.24	.31	.3		
21				-.27	.15	.17				.05	.78	.3		
22				-.27	.15	.17				.05	.25	.3		
23	-.27			-.02			.74	.00	.00	.46	.66	.3		
24	.00			.00			.00	.50	.00	.46	.67	.3		
25	-.05			.00			.00	.00	.25	.20	.40	.3		
26														
27	SB	SM	SO	OS	OM	OO	CT	SU	TB	SBF	SPK	SAL	SPM	SPE
28	.00	.00	.00	.00	.00	.00	.00	.00	.00					
29	.00	.00	.00	.00	.00	.00	.00	.00	.00					
30	.00	.00	.00	.00	.00	.00	.00	.00	.00					
31	.00	.00	.00	.00	.00	.00	.00	.00	.00					
32	.00	.00	.00	.00	.00	.00	.00	.00	.00					
33	.00	.00	.00	.00	.00	.00	.00	.00	.00					
34	.00	.00	.00	.00	.00	.00	.00	.00	.00					
35	.00	.00	.00	.00	.00	.00	.00	.00	.00					
36	.00	.00	.00	.00	.00	.00	.00	.00	.00					
37	.00	.00	.00	.00	.00	.00	.00	.00	.00	.05	.03		.07	.04
38	.00	.02	.00	.00	.01	.00	.00	.01	.00	.21	.25	.001	.11	.08
39	.00	.01	.00	.00	.01	.00	.00	.00	.00	.24	.27	.005	.11	.08
40	.00	.00	.00	.00	.00	.00	.00	.00	.00					
41	-.30	.15	.09	.00	.00	.00	.00	.00	.00					
42		-.83	.00	.00	.04	.00	.00	.00	.00	.11	.31		.36	.12
43		.00	-.37	.00	.00	.15	.00	.00	.00					
44	.00			-.34	.13	.14	.00	.00	.00					
45	.00	.26	.00		-1.25	.00	.00	.00	.00	.11	.31		.36	.12
46	.00	.00	.49		.00	-.69	.00	.00	.00					
47	.00	.00	.00	.00	.00	.00	-.20	.00	.00					
48	.00	.00	.00	.00	.00	.00	.00	-.24	.00					
49	.00	.00	.00	.00	.00	.00	.00	.00	-.20					

[illegible]

Appendix B--Country Model Spreadsheet--DEMOBUS--continued

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
	DEMOBUS	WDPPRICE	PRPRICE	CNPRICE	TDPRICE	XRATE	SUPPLY	DEMAND	NTRADE	CTRAN.EL	WDPT.EL	SSHIFT	DSHIFT	PRSUBW
52														
53	BF	2567	2523	4539	2460		10655	11160	-505					
54	PK	2176	1290	2576	1290		7176	7461	-285					
55	ML	2321	2394	4788	2381		157	182	-25					
56	PM	1039	1121	2015	1103		9984	9558	426					
57	PE	1696	1150	1909	1140		4104	4031	73.24					
58	DM	272	301	595	260		65432	65432	0					
59	DB	2866	2820	3376	2026		572	506	66					
60	DC	3009	3060	4229	2199		2531	2649	-118					
61	DP	2326	2326	2720	1671		395	251	144					
62	WH	169	159	198	135		55406	22486	32920					
63	CN	111	115	99	89		191198	131556	59642					
64	CG	105	108	91	82		30245	22397	7848					
65	RI	320	329	438	223		5010	2675	2335					
66	SB	275	205	214	203		52439	35665	16774					
67	SM	247	170	212	170		24518	20119	4399					
68	SO	431	452	904	452		5743	5086	657					
69	OS	630	119	132	119		6900	6642	258					
70	OM	200	185	231	185		2242	2487	-245					
71	OO	774	441	882	441		1068	1612	-544					
72	CT	1674	1647	2540	1270		2655	957	1698					
73	SU	282	357	712	250		6089	7379	-1290					
74	TB	3844	3583	7166	3583		559	514	45					

	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
	CNSUBW	IMSUBW	EXSUBW	SCROSSO	DCROSSO	TDCONST	PRCONST	CNCONST	LPRPRICE	LCNPRICE	SCROSS	DCROSS	SCONST	DCONST
52														
53						.9582820	63.13320	2015.898	2523.043	4538.941	.7274847	1.860713	133.2217	2176973.
54						.5928309	0	1286.329	1290	2576.329	.0452463	4.086343	122.9447	1566474.
55						1.025783	13.15781	2393.904	2394	4787.904	.7960886	4.111310	.3905161	16679.88
56						1.061530	18.14737	894.0864	1121.077	2015.163	.2814944	2.482484	369.4638	272831.4
57						.6722939	9.789523	758.9100	1150	1908.910	.2289478	1	371.6107	56710.43
58						.9576531	40.51835	294.2144	301	595.2144	.9108421	99.62866	4140.605	1825.382
59						.7069760	793.8069	555.8650	2820	3375.865	.0215766	1	335.5650	84534.33
60						.7306859	861.3661	1168.973	3060	4228.973	.0636339	1	1366.471	397029.6
61						.7185084	654.7494	393.6151	2326	2719.615	.1541595	1	231.7276	42865.07
62						.7984994	23.58950	39.14869	158.5359	197.6846	.2706740	18.34960	9795.661	16342.27
63					5.276774	.8018018	25.54943	-15.7148	114.5494	98.83458	.3134503	892.0737	62661.10	1102.221
64						.7809524	26.25207	-17.1420	108.2521	91.11010	.0376834	111810.0	7769.834	101.3703
65						.696875	105.9063	108.6930	328.9063	437.5993	1	493.1838	12234.69	
66						.7381818	1.525582	9.044224	204.5256	213.5698	.2235344	42665.64	9473.645	4.178553
67						.6882591	0	42.49734	170	212.4973	.4893740	16125.96	17937.19	106.6066
68						1.048724	0	451.9819	452	903.9819	.6862699	2.765789	4018.160	22821.09
69						.1888889	0	13.22075	119	132.2208	.1805201	863.6223	2725.407	42.50401
70						.925	0	46.24711	185	231.2471	.7530151	136644.4	1360.681	16.41268
71						.5697674	0	440.9824	441	881.9824	.6051465	28.08784	626.8392	6183.211
72						.7586619	376.6478	893.3014	1646.648	2539.949	.1746455	1	70.96261	4689.031
73						.8871428	106.3602	355.4513	356.5345	711.9858	.8165728	1.096221	394.9120	32560.60
74						.9321020	0	3582.857	3583	7165.857	.7664126	1	94.27303	3034.008

	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP
	SUPPLYEQ	DEMANDEQ	NTRADEEQ	TRADEEQ	SUPGROW	INCELAS	PTELAS	DPWS	CSW	MSW	ESW	NTSSHIFT	SUPPLYD	DEMANDD
52														
53	10655	11160	-505		.0043	.16	.65	19	14	-44	0		0	0
54	7176	7461	-285		.0135	.05	1	0	4	0	0		0	0
55	157	182	-25		0	.13	.9	0	0	-13	0		0	0
56	9984	9558	426		.018	.11	1	8	8	0	10		0	0
57	4104	4031	73.24		.001	.05	1	0	8	0	10		0	0
58	65432	65432	0	0	.009	-.01	.2	41	-34	0	0	10	0	0
59	572	506	66		.009	-.10	.2	0	149	0	794		0	0
60	2531	2649	-118		.009	.35	.2	861	-719	0	0		0	0
61	395	251	144		.009	.38	.2	0	188	0	655		0	0
62	55406	22486	32920		.0185	-.18	1	19	2	0	5		0	0
63	191198	131556	59642		.017	-.12	1	26	0	0	0		0	0
64	30245	22397	7848		.01	-.08	1	26	0	0	0		0	0
65	5010	2675	2335		.0225	.14	.8	106	8	0	0		0	0
66	52439	35665	16774		.021	.20	1	2	0	0	0		0	0
67	24518	20119	4399		.02	.33	1	0	0	0	0		0	0
68	5743	5086	657		.02	.00	1	0	0	0	0		0	0
69	6900	6642	258		.022	.15	1	0	0	0	0		0	0
70	2242	2487	-245		.02	.33	1	0	0	0	0		0	0
71	1068	1612	-544		.02	.00	1	0	0	0	0		0	0
72	2655	957	1698		.011	.40	1	377	0	0	0		0	0
73	6089	7379	-1290		.005	.04	.2	106	-106	0	0		0	0
74	559	514	45		.01	.22	1	0	0	0	0		0	0

	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD
	NTRADE	PRPRICE	CNPRICE	TDPRICE	SUPPLY	PRPRICE	DEMAND	CNPRICE	NTRADE	PBSE	CBSE	PSURPLUS	CSURPLUS	GDPVAL
51														
52	0	0	0	0	0	0	0	0	0	19	14	0	0	27351
53	0	0	0	0	0	0	0	0	0	0	4	0	0	15615
54	0	0	0	0	0	0	0	0	0	0	0	0	0	364
55	0	0	0	0	0	0	0	0	0	8	8	0	0	10373
56	0	0	0	0	0	0	0	0	0	0	8	0	0	6960
57	0	0	0	0	0	0	0	0	0	0	7	0	0	0
58	0	0	0	0	0	0	0	0	0	0	149	0	0	1639
59	0	0	0	0	0	0	0	0	0	0	142	0	0	7616
60	0	0	0	0	0	0	0	0	0	0	188	0	0	919
61	0	0	0	0	0	0	0	0	0	19	2	0	0	0
62	0	0	0	0	0	0	0	0	0	26	0	0	0	0
63	0	0	0	0	0	0	0	0	0	26	0	0	0	0
64	0	0	0	0	0	0	0	0	0	106	8	0	0	1603
65	0	0	0	0	0	0	0	0	0	2	0	0	0	0
66	0	0	0	0	0	0	0	0	0	0	0	0	0	0
67	0	0	0	0	0	0	0	0	0	0	0	0	0	0
68	0	0	0	0	0	0	0	0	0	0	0	0	0	2475
69	0	0	0	0	0	0	0	0	0	0	0	0	0	0
70	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71	0	0	0	0	0	0	0	0	0	0	0	0	0	827
72	0	0	0	0	0	0	0	0	0	377	0	0	0	4444
73	0	0	0	0	0	0	0	0	0	1	0	0	0	1717
74	0	0	0	0	0	0	0	0	0	0	0	0	0	2149

	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR
	FARMVAL	GOVTEXPD	NEWGEXPD	WELFARE	MKPRICE	CQRENT	PTAXE	MPSURPLS	LSHRPSW	LSHRCSW	LSHRMSW	LSHRESW	BGREXP	BGRIMP
52														
53	26680	0	0	0	2504	0	0	0	.00	.00	.00	.00	482	987
54	9257	0	0	0	1290	0	0	0	.00	.00	.00	.00	122	407
55	376	0	0	0	2394	0	0	0	.00	.00	.00	.00	2	27
56	11112	0	0	0	1113	0	0	0	.00	.00	.00	.00	426	0
57	4720	0	0	0	1150	0	0	0	.00	.00	.00	.00	83	10
58	19695	0	0	0	301	0	0	0	.00	.00	.00	.00	0	0
59	1613	0	0	0	2820	0	0	0	.00	.00	.00	.00	68	2
60	7745	0	0	0	3060	0	0	0	.00	.00	.00	.00	7	125
61	919	0	0	0	2326	0	0	0	.00	.00	.00	.00	145	1
62	7757	0	0	0	140	0	-35	0	.00	.00	.00	.00	33557	637
63	17017	0	0	0	89	0	-22	0	.00	.00	.00	.00	59693	51
64	2480	0	0	0	82	0	-22	0	.00	.00	.00	.00	9208	1360
65	1117	0	0	0	223	0	-129	0	.00	.00	.00	.00	2497	162
66	10645	0	0	0	203	0	-12	0	.00	.00	.00	.00	16874	100
67	4168	0	0	0	170	0	0	0	.00	.00	.00	.00	4404	5
68	2596	0	0	0	452	0	0	0	.00	.00	.00	.00	680	23
69	821	0	0	0	119	0	-15	0	.00	.00	.00	.00	607	349
70	415	0	0	0	185	0	0	0	.00	.00	.00	.00	131	376
71	471	0	0	0	441	0	0	0	.00	.00	.00	.00	435	979
72	3372	0	0	0	1270	0	-319	0	.00	.00	.00	.00	1698	0
73	2168	0	0	0	356	0	-7	0	.00	.00	.00	.00	463	1753
74	2003	0	0	0	3583	0	0	0	.00	.00	.00	.00	225	180

Appendix B--Country Model Spreadsheet--DEMOBUS--concluded

	BS	BT	BU	BV	BW	BX	BY	BZ	CA	CB	CC	CD	CE	CF
51														
52	LGREXP	LGRIMP	BWDPRICE	BNTRADEV	LNTRADEV	NTRADEV	BSELFSTR	LSELFSTR	MBSE	EBSE	GREXPD	GRIMPD	GREXP%	GRIMP%
53	482	987	2567	-1296	-1296	0	.95	.95	-44	0	0	0	.00	.00
54	122	407	2176	-620	-620	0	.96	.96	0	0	0	0	.00	.00
55	2	27	2321	-58	-58	0	.86	.86	-13	0	0	0	.00	.00
56	426	0	1039	443	443	0	1.04	1.04	0	10	0	0	.00	.00
57	83	10	1696	124	124	0	1.02	1.02	0	10	0	0	.00	.00
58	0	0	272	0	0	0	1.00	1.00	0	0	0	0	.00	.00
59	68	2	2866	189	189	0	1.13	1.13	0	794	0	0	.00	.00
60	7	125	3009	-355	-355	0	.96	.96	0	0	0	0	.00	.00
61	145	1	2326	335	335	0	1.57	1.57	0	655	0	0	.00	.00
62	33557	637	169	5563	5563	0	2.46	2.46	0	5	0	0	.00	.00
63	59693	51	111	6620	6620	0	1.45	1.45	0	0	0	0	.00	.00
64	9208	1360	105	824	824	0	1.35	1.35	0	0	0	0	.00	.00
65	2497	162	320	747	747	0	1.87	1.87	0	0	0	0	.00	.00
66	16874	100	275	4613	4613	0	1.47	1.47	0	0	0	0	.00	.00
67	4404	5	247	1087	1087	0	1.22	1.22	0	0	0	0	.00	.00
68	680	23	431	283	283	0	1.13	1.13	0	0	0	0	.00	.00
69	607	349	630	163	163	0	1.04	1.04	0	0	0	0	.00	.00
70	131	376	200	-49	-49	0	.90	.90	0	0	0	0	.00	.00
71	435	979	774	-421	-421	0	.66	.66	0	0	0	0	.00	.00
72	1698	0	1674	2842	2842	0	2.77	2.77	0	0	0	0	.00	.00
73	463	1753	282	-364	-364	0	.83	.83	0	0	0	0	.00	.00
74	225	180	3844	173	173	0	1.09	1.09	0	0	0	0	.00	.00

	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT
51														
52	BQRENT	BDEMP	LDEMP	BPVALUE	PSUPPRT	PROJADJ	SHNFED	SHCONS	EXTREVC	SETSIDE	PPRMT	MKSUPRT
53	0	45.16	45.16	26883	673	1.00						.00	2523	44
54	0	30.19	30.19	9257	0	1.00						.00	1290	0
55	0	.74	.74	376	2	1.00						.00	2394	13
56	0	38.68	38.68	11193	181	1.00						.00	1121	10
57	0	16.31	16.31	4720	40	1.00						.00	1150	10
58	0	264.76	264.76	19695	2651	1.00	.58		.42			.00	301	41
59	0	2.05	2.05	1613	454	1.00						.00	2820	794
60	102	10.72	10.72	7745	2180	1.00						.00	3060	861
61	0	1.02	1.02	919	259	1.00						.00	2326	655
62	0	90.99	90.99	8784	1307	1.00		.22	.78			.09	159	5
63	0	532.33	532.33	21902	4885	1.00		.80	.20			.07	115	0
64	0	90.63	90.63	3274	794	1.00		.87	.14			.11	108	0
65	0	10.82	10.82	1648	531	1.00						.22	329	0
66	0	144.32	144.32	10725	80	1.00		.95	.05			.00	205	0
67	0	81.41	81.41	4168	0	1.00		1.00	.00			.00	170	0
68	0	20.58	20.58	2596	0	1.00						.00	452	0
69	0	26.88	26.88	821	0	1.00		.70	.30			.00	119	0
70	0	10.06	10.06	415	0	1.00		1.00	.00			.00	185	0
71	0	6.52	6.52	471	0	1.00						.00	441	0
72	0	3.87	3.87	4372	1000	1.00						.10	1647	0
73	137	29.86	29.86	2171	648	1.00						.00	357	106
74	0	2.08	2.08	2003	0	1.00						.00	3583	0

	CU	CV	CW	CX	CY	CZ	DA	DB	DC
51									
52	BCVALUE								
53	50655				0	10655	0	0	0
54	19222				0	7176	0	0	0
55	871				0	157	0	0	0
56	19261				0	9984	0	0	0
57	7694				0	4104.01	0	0	0
58	38946				0	65432	0	0	0
59	1708				0	572	0	0	0
60	11203				0	2531	0	0	0
61	683				0	395	0	0	0
62	4445				0	55406	0	0	0
63	13002				0	191198	0	0	0
64	2041				0	30245	0	0	0
65	1171				0	5010	0	0	0
66	7617				0	51559.67	0	0	0
67	4275				0	24518	0	0	0
68	4598				0	5743	0	0	0
69	878				0	6815.658	0	0	0
70	575				0	2242	0	0	0
71	1422				0	1068	0	0	0
72	2431				0	2974.893	0	0	0
73	5254				0	6089	0	0	0
74	3683				0	559	0	0	0

Country Base Data Spreadsheet--DEMOTUS

	A	B	C	D	E	F	G	H	I	J
1	DEMOTUS	Total	Total	Net	Domestic	Domestic	TSDATA			
2	1989	Imports	Exports	Trade	Supply	Demand	PROW#->	3		
3	BF	987	482	-505	10655	11160		Beef & veal		
4	PK	407	122	-285	7176	7461		Pork		
5	ML	27	2	-25	157	182		Mutton, Lamb & goat		
6	PM	0	426	426	9984	9558		Poultry Meat		
7	PE	10	83	73	4104	4031		Poultry Eggs		
8	DM	0	0	0	65432	65432		Dairy Milk		
9	DB	2	68	66	572	506		Dairy - Butter		
10	DC	125	7	-118	2531	2649		Dairy - Cheese		
11	DP	1	145	144	395	251		Dairy - Powder		
12	WH	637	33557	32920	55406	22486		Wheat		
13	CN	51	59693	59642	191198	131556		Corn		
14	CG	1360	9208	7848	30245	22397		other Coarse Grains		
15	RI	162	2497	2335	5010	2675		Rice		
16	SB	100	16874	16774	52439	35665		SoyBeans		
17	SM	5	4404	4399	24518	20119		SoyMeal		
18	SO	23	680	657	5743	5086		SoyOil		
19	OS	349	607	258	6900	6642		Other oilSeeds		
20	OM	376	131	-245	2242	2487		Other Meals		
21	OO	979	435	-544	1068	1612		Other Oils		
22	CT	0	1698	1698	2655	957		Cotton		
23	SU	1753	463	-1290	6089	7379		Sugar		
24	TB	180	225	45	559	514		Tobacco		
25										
26	BN							dry Beans		
27	CF	120		-120	900	1020		green Coffee		
28	HS	29	590	561	1073	512		Hides & Skins		
29	CI	40142	1459	-38683	99180	137863		Cattle Inventory		
30	PI	91884	1074	-90810	55469	146279		Pig Inventory		
31	SI	7739	143	-7596	10858	18454		Sheep Inventory		
32	TG	6	1300	1294	3280	1986		Tallow & Grease		

Products in model
DEMO (22 products)

Base data for other
variables in FAS
database

Printout of Supply, Demand, and Feed Share Elasticities for DEMOBUS created by the program EOUT

41Shares of Product Going to Intermediate Demand

AN UBER SWOPSIM feature!

Printout of Base Data from country model, support, and base data spreadsheets for model DEMOBUS, created by program BOUT

42

Appendix C--Output Examples--EOUT, BOUT, SOUT--continued

3 page printout of solution for the US from simulation of model DEMOWD produced by program SOUT

Solution printout P. 1 12/14/90																					
Solution----->																					
Base year ----->																					
DEMOWAL US, EC LI																					
1989																					
No. projection years -->																					
Model--> DEMOWD																					
to Lib. % -->																					
---Liberalization Percentages---																					
DPSW 1.00 CSW 1.00 MSW 1.00 ESW 1.00																					
US	WOPRICE	PRPRICE	CNPRICE	TDPRICE	XRATE	SUPPLY	DEMAND	NTRADE	CTRAN.EL	WDPT.EL	SSHIFT	DSHIFT	PRSUBW	CNSUBW	IMSUBW	EXSUBW	SCROSSO	DCROSSO	TDCONST	PRCONST	CNCONST
BF	2869	2523	4539	2460	1	10655	11160	-505	1	1	1	1	19	14	-44	-44	1	1	1	63.13320	2015.898
PK	2283	1290	2576	1290	1	7176	7461	-285	1	1	1	1	8	8	-13	10	1	1	1	13.15781	1286.329
ML	3076	2394	4788	2381	1	157	182	-25	1	1	1	1	8	8	-13	10	1	1	1	18.14737	2393.904
PM	1257	1121	2015	1103	1	9984	9558	426	1	1	1	1	8	8	-13	10	1	1	1	9.789523	758.9100
PE	1778	1150	1909	1140	1	4104	4031	73	1	1	1	1	41	41	-34	794	1	1	1	40.51835	294.2144
DM	272	301	595	260	1	65432	65432	66	1	1	1	1	861	861	-719	655	1	1	1	7.793.8069	555.8650
D8	5140	2820	3376	2026	1	572	2649	-118	1	1	1	1	19	19	-188	5	1	1	1	654.7494	393.6151
DC	5756	3060	4229	2029	1	395	22486	32920	1	1	1	1	26	26	188	5	1	1	1	8.23.58950	39.14869
DP	4818	2326	2720	1671	1	191198	131556	59642	1	1	1	1	106	106	2	5	1	1	1	8.25.54943	-15.7148
WH	171	159	188	135	1	30245	22397	7848	1	1	1	1	2	2	8	5	1	1	1	8.26.25207	-17.1420
CN	120	115	99	89	1	5010	2675	2335	1	1	1	1	2	2	8	5	1	1	1	7.105.9063	108.6930
CG	114	108	91	82	1	52439	35665	16774	1	1	1	1	2	2	8	5	1	1	1	7.1.525582	9.044224
RI	321	329	438	223	1	24518	20119	4399	1	1	1	1	2	2	8	5	1	1	1	7.1.525582	9.044224
SB	270	205	214	203	1	5743	5086	657	1	1	1	1	2	2	8	5	1	1	1	7.1.525582	9.044224
SM	245	170	212	170	1	6900	6642	258	1	1	1	1	2	2	8	5	1	1	1	7.1.525582	9.044224
SO	426	452	904	452	1	2242	2487	-544	1	1	1	1	2	2	8	5	1	1	1	7.1.525582	9.044224
OS	620	119	132	185	1	1068	1612	-245	1	1	1	1	2	2	8	5	1	1	1	7.1.525582	9.044224
OM	773	441	882	441	1	2655	1957	1608	1	1	1	1	2	2	8	5	1	1	1	7.1.525582	9.044224
OO	1538	1647	2540	1270	1	6089	7379	-1290	1	1	1	1	2	2	8	5	1	1	1	7.1.525582	9.044224
CT	312	357	712	250	1	559	514	45	1	1	1	1	2	2	8	5	1	1	1	7.1.525582	9.044224
SU	3841	3583	7166	3583	1	559	514	45	1	1	1	1	2	2	8	5	1	1	1	7.1.525582	9.044224
TB																					
Solution----->																					
Base year ----->																					
DEMOWAL US, EC LI																					
1989																					
No. projection years -->																					
Model--> DEMOWD																					
to Lib. % -->																					
---Liberalization Percentages---																					
DPSW 1.00 CSW 1.00 MSW 1.00 ESW 1.00																					
US	WOPRICE	PRPRICE	CNPRICE	TDPRICE	XRATE	SUPPLY	DEMAND	NTRADE	CTRAN.EL	WDPT.EL	SSHIFT	DSHIFT	PRSUBW	CNSUBW	IMSUBW	EXSUBW	SCROSSO	DCROSSO	TDCONST	PRCONST	CNCONST
BF	2749	4798	7243319	1.869166	133.2217	2176973.	11169	10784	385	1	1	1	19	19	14	-44	1	1	1	63.13320	2015.898
PK	1354	2644	0.438345	4.135371	122.9447	156679.88	7295	7385	-90	1	1	1	8	8	-13	10	1	1	1	13.15781	1286.329
ML	3156	5550	0.7932656	4.130438	3905161	16679.88	195	165	2064	1	1	1	8	8	-13	10	1	1	1	18.14737	2393.904
PM	1335	2245	2.796193	2.495447	369.4638	272831.4	11108	9043	2064	1	1	1	8	8	-13	10	1	1	1	9.789523	758.9100
PE	1195	1962	2.249000	2.495447	371.6107	56710.43	4118	3992	125	1	1	1	8	8	-13	10	1	1	1	40.51835	294.2144
DM	325	626	0.903967	104.1356	4140.605	1825.382	67848	67848	168	64	1	1	41	41	-34	794	1	1	1	7.793.8069	555.8650
D8	3634	4339	0.196911	1	335.5650	84534.33	600	2258	425	1	1	1	861	861	-719	655	1	1	1	654.7494	393.6151
DC	4206	5517	0.590186	1	336.7276	397089.6	2683	2258	425	1	1	1	19	19	14	-44	1	1	1	8.23.58950	39.14869
DP	3462	4044	1.429782	18.81266	9795.661	1634.27	58298	23100	35197	1	1	1	26	26	188	5	1	1	1	8.26.25207	-17.1420
WH	137	197	2.865744	920.8529	62661.10	1102.221	193098	129130	8497	1	1	1	106	106	2	5	1	1	1	7.105.9063	108.6930
CN	96	106	3.224832	120949.7	7769.834	101.3703	30403	21906	8497	1	1	1	2	2	8	5	1	1	1	7.1.525582	9.044224
CG	89	98	0.414504	120949.7	7769.834	101.3703	30403	21906	8497	1	1	1	2	2	8	5	1	1	1	7.1.525582	9.044224
RI	223	446	1	42655.67	9473.645	4.178553	53378	35850	17527	1	1	1	2	2	8	5	1	1	1	7.1.525582	9.044224
SB	199	210	2.352065	17050.42	17937.19	106.6066	24567	21372	3195	1	1	1	2	2	8	5	1	1	1	7.1.525582	9.044224
SM	169	211	4.910361	2.765455	4018.160	22821.09	5097	5097	659	1	1	1	2	2	8	5	1	1	1	7.1.525582	9.044224
SO	446	898	6.888518	2.765455	4018.160	22821.09	5097	5097	659	1	1	1	2	2	8	5	1	1	1	7.1.525582	9.044224
OS	117	130	1.614715	858.5139	2725.407	42.50401	7164	6637	579	1	1	1	2	2	8	5	1	1	1	7.1.525582	9.044224
OM	178	225	7.558295	146585.1	1360.681	16.41268	2238	2767	579	1	1	1	2	2	8	5	1	1	1	7.1.525582	9.044224
OO	440	881	6049300	28.00289	626.8392	6183.211	1067	1608	541	1	1	1	2	2	8	5	1	1	1	7.1.525582	9.044224
CT	1297	2709	1.761753	1	70.96261	4689.031	3040	1608	541	1	1	1	2	2	8	5	1	1	1	7.1.525582	9.044224
SU	277	633	8.213875	1.097752	394.6120	32560.60	5401	7600	2075	1	1	1	2	2	8	5	1	1	1	7.1.525582	9.044224
TB	3580	7163	7.674506	1	94.27303	3034.008	560	514	46	1	1	1	2	2	8	5	1	1	1	7.1.525582	9.044224
Solution----->																					
Base year ----->																					
DEMOWAL US, EC LI																					
1989																					
No. projection years -->																					
Model--> DEMOWD																					
to Lib. % -->																					
---Liberalization Percentages---																					
DPSW 1.00 CSW 1.00 MSW 1.00 ESW 1.00																					
US	WOPRICE	PRPRICE	CNPRICE	TDPRICE	XRATE	SUPPLY	DEMAND	NTRADE	CTRAN.EL	WDPT.EL	SSHIFT	DSHIFT	PRSUBW	CNSUBW	IMSUBW	EXSUBW	SCROSSO	DCROSSO	TDCONST	PRCONST	CNCONST
BF	226	259	11.75	4.8	9.0	3.4	5.7	-176.6	19	1	1	1	19	19	14	-44	1	1	1	63.13320	2015.898
PK	64	67	4.94	1.7	4.9	-3.4	2.6	-68.8	8	1	1	1	8	8	-13	10	1	1	1	13.15781	1286.329
ML	762	762	32.55	24.3	31.8	-5.4	15.9	-230.2	8	1	1	1	8	8	-13	10	1	1	1	18.14737	2393.904
PM	214	230	21.01	11.3	19.1	-9.4	11.4	383.7	8	1	1	1	8	8	-13	10	1	1	1	9.789523	758.9100
PE	45	53	4.82	3.7	7.9	-1.0	2.8	70.4	8	1	1	1	41	41	-34	794	1	1	1	40.51835	294.2144
DM	30	30	3.7	7.9	7.9	-1.0	2.8	70.4	8	1	1	1	41	41	-34	794	1	1	1	40.51835	294.2144
D8	814	963	79.34	4.9	28.9	-14.6	28.5	152.4	19	1	1	1	861	861	-719	655	1	1	1	7.793.8069	555.8650
DC	1146	1288	91.30	6.0	37.4	-14.7	30.5	-463.8	19	1	1	1	861	861	-719	655	1	1	1	7.793.8069	555.8650
DP	1136	1324	107.16	4.9	48.8	-12.7	48.7	52.7	19	1	1	1	861	861	-719	655	1	1	1	7.793.8069	555.8650
WH	-1	-1	1.42	5.2	-13.7	2.7	7.2	6.9	26	1	1	1	2	2	8	5	1	1	1	7.105.9063	108.6930
CN	-22	-7	7.96	1.0	-16.1	-1.8	7.2	7.3	106	1	1	1	2	2	8	5	1	1	1	7.1.525582	9.044224
CG	-19	9	8.41	4.5	-17.9	-2.2	2.0	10.3	2	1	1	1	2	2	8	5	1	1	1	7.1.525582	9.044224
RI	-105	-5	-1.94	1.8	-32.1	-5.5	-1.8	4.5	106	1	1	1	2	2	8	5	1	1	1	7.1.525582	9.044224
SB	-5	-1	-1.94	1.8	-32.1	-5															

Appendix C--Output Examples--EOUT, BOUT, SOUT--continued

[illegible]

Appendix C--Output Examples--EOUT, BOUT, SOUT--concluded

[illegible]

Appendix D--SWOPSIM Country Model Variable List

Variables in SWOPSIM Models			
COL. #	VARIABLE	COL.	Variable Description-----
2	WDPRICE	B	World PRICE (in current solution)
3	PRPRICE	C	base Producer PRICE
4	CNPRICE	D	base Consumer PRICE
5	TDPRICE	E	base Trade PRICE
6	XRATE	F	exchange RATE
7	SUPPLY	G	base SUPPLY quantity
8	DEMAND	H	base DEMAND quantity
9	NTRADE	I	base Net TRADE
10	CTRADE	J	Country price TRANSMISSION Elasticity variable
11	WDPT.EL	K	product World Price Trans. Elasticity variable
12	SSHIFT	L	Supply SHIFT variable
13	DSHIFT	M	Demand SHIFT variable
14	PRSUBW	N	Producer SUBSIDY Wedge variable
15	CNSUBW	O	Consumer SUBSIDY Wedge variable
16	IMSUBW	P	Import SUBSIDY Wedge variable
17	EXSUBW	Q	Export SUBSIDY Wedge variable
18	SCROSSD	R	Supply equation CROSS price Overflow term
19	DCROSSD	S	Demand equation CROSS price Overflow term
20	TDCONST	T	World-Trade price CONSTANT
21	PRCONST	U	Producer-trade price CONSTANT
22	CNCONST	V	Consumer-producer price CONSTANT
23	LPRPRICE	W	Liberalized Producer PRICE
24	LCNPRICE	X	Liberalized Consumer PRICE
25	SCROSS	Y	Supply equation CROSS price term
26	DCROSS	Z	Demand equation CROSS price term
27	SCONST	AA	Supply equation CONSTANT
28	DCONST	AB	Demand equation CONSTANT
29	SUPPLYEQ	AC	Liberalized SUPPLY Equation quantity
30	DEMANDEQ	AD	Liberalized DEMAND Equation quantity
31	NTRADEEQ	AE	Liberalized Net TRADE Equation quantity
32	TRADEEQ	AF	price adjustment for no TRADE or Quantity or price policy
33	SUPGROW	AG	SUPPLY GROWTH rate
34	INCELAS	AH	INCOME ELASTICITY
35	PTELAS	AI	Product world price TRANSMISSION ELASTICITY
36	DPSW	AJ	Distorting Producer Subsidy price Wedge
37	CSW	AK	Consumer Subsidy price Wedge
38	MSW	AL	Import Subsidy price Wedge
39	ESW	AM	Export Subsidy price Wedge
40	NTSSHIFT	AN	Non-Trade policy Supply SHIFT term
41	SUPPLYD	AO	SUPPLY quantity Difference from base
42	DEMANDD	AP	DEMAND quantity Difference from base
43	NTRADED	AQ	Net TRADE quantity Difference from base
44	PRPRICED	AR	Producer PRICE Difference from base
45	CNPRICED	AS	Consumer PRICE Difference from base
46	TDPRICE%	AT	Trade PRICE % change from base
47	SUPPLY%	AU	SUPPLY quantity % change from base
48	PRPRICE%	AV	Producer PRICE % change from base
49	DEMAND%	AW	DEMAND quantity % change from base
50	CNPRICE%	AX	Consumer PRICE % change from base
51	NTRADE%	AY	Net TRADE quantity % change from base
52	PBSE	AZ	Producer Budget Subsidy Equivalent rate
53	CBSE	BA	Consumer Budget Subsidy Equivalent rate
54	PSURPLUS	BB	Producer SURPLUS change (total)
55	CSURPLUS	BC	Consumer SURPLUS change
56	GDPVAL	BD	Gross Domestic Product VALUE (at LWDPRICE)
57	FARMVAL	BE	FARM VALUE (at MKPRICE)
58	GOVTEXPD	BF	GOVERNMENT EXPENDITURE change from base
59	NEWGEXPD	BG	NEW GOVERNMENT EXPENDITURE from base
60	WELFARE	BH	total WELFARE change
61	MKPRICE	BI	Market PRICE at producer level
62	QORENT	BJ	Change in Quota RENT
63	PTAXE	BK	Producer TAX Equivalent (of supply controls)
64	MPSURPLUS	BL	minimum (excluded) Producer SURPLUS change
65	LSHRPSW	BM	Liberalized SHARE of dPSW (used for welfare cal.)
66	LSHRCSW	BN	Liberalized SHARE of CSW (used for welfare cal.)
67	LSHRMSW	BO	Liberalized SHARE of MSW (used for welfare cal.)
68	LSHRESW	BP	Liberalized SHARE of ESW (used for welfare cal.)
69	BGREXP	BQ	Base Gross EXPORTS
70	BGRIMP	BR	Base Gross IMPORTS
71	LGREXP	BS	Liberalized (estimated) Gross EXPORTS
72	LGRIMP	BT	Liberalized (estimated) Gross IMPORTS
73	BWDPRICE	BU	Base World PRICE
74	BNTRADEV	BV	Base Net TRADE Value (using base world price)
75	LNTRADEV	BW	Liberalized Net TRADE Value (using lib. world price)
76	NTRADEV	BX	Net TRADE Value Difference from base
77	BSELFSTR	BY	Base SELF SUFFICIENCY Ratio
78	LSELFSTR	BZ	Liberalized SELF SUFFICIENCY Ratio
79	MBSE	CA	Import Budget Subsidy Equivalent rate
80	EBSE	CB	Export Budget Subsidy Equivalent rate
81	GREXP	CC	Gross EXPORT quantity Difference from base
82	GRIMP	CD	Gross IMPORT quantity Difference from base
83	GREXP%	CE	Gross EXPORT quantity % change from base
84	GRIMP%	CF	Gross IMPORT quantity % change from base
85	BQRENT	CG	Base Quota RENT
86	BDEMP	CH	Base DEMAND Per Capita
87	LDEMP	CI	Liberalized (new) DEMAND Per Capita
88	BPVALUE	CJ	Base Producer VALUE
89		CK	(empty column)
90	PROJADJ	CL	PROJECTION ADJUSTMENT variable for projections
91		CM	(empty column)
92	SHNFED	CN	Share of feeds Not FED in model
93	SHCONS	CO	Share of Intermediate product CONSUMED in model
94		CP	(empty column)
95	EXTREVC	CQ	EXTRA REVENUE Change from price policies
96	SETSIDE	CR	SET-aside shift variable when set-asides removed
97	PPRMAT	CS	Producer PRICE minus set-aside Tax
98	MKSUPRT	CT	Market SUPPORT Rate
99	BCVALUE	CU	Base Consumption VALUE

variables in country spreadsheet which are carried over into world model

Indicator variables in country model spreadsheets which are calculated from world model solution output but which are not contained in world models

Get these timely reports from USDA's Economic Research Service



These periodicals bring you the latest information on food, the farm, and rural America to help you keep your expertise up-to-date. Order these periodicals today to get the latest facts, figures, trends, and issues from ERS.

Agricultural Outlook. Presents USDA's farm income and food price forecasts. Emphasizes the short-term outlook, but also presents long-term analyses of issues ranging from international trade to U.S. land use and availability. 11 issues. 1 year, \$26; 2 years, \$51; 3 years, \$75.

Economic Indicators of the Farm Sector. Updates economic trends in U.S. agriculture. Each issue explores a different aspect of income and expenses: national and State financial summaries, production and efficiency statistics, and costs of production for livestock and dairy and for major field crops. 5 issues. 1 year, \$14; 2 years, \$27; 3 years, \$39.

Farmline. Concise, fact-filled articles focus on economic conditions facing farmers, how the agricultural environment is changing, and the causes and consequences of those changes for farm and rural people. 11 issues. 1 year, \$12; 2 years, \$23; 3 years, \$33.

Food Review. Offers the latest developments in food prices, product safety, nutrition programs, consumption patterns, and marketing. 4 issues. 1 year, \$11; 2 years, \$21; 3 years, \$30.

Foreign Agricultural Trade of the United States. Updates the quantity and value of U.S. farm exports and imports, plus price trends. 8 issues. 1 year, \$25; 2 years, \$49; 3 years, \$72.

Rural Development Perspectives. Crisp, nontechnical articles on the results of new rural research and what those results mean. 3 issues. 1 year, \$9; 2 years, \$27; 3 years, \$24.

Rural Conditions and Trends. Tracks rural events: macroeconomic conditions, employment and underemployment, industrial structure, earnings and income, poverty and population. 4 issues. 1 year, \$14; 2 years, \$27; 3 years, \$39.

The Journal of Agricultural Economics Research. Technical research in agricultural economics, including econometric models and statistics focusing on methods employed and results of USDA economic research. 4 issues. 1 year, \$8; 2 years, \$15; 3 years, \$21.

World Agriculture. Deals with worldwide developments in agricultural markets and trade with an emphasis on implications for global and U.S. agricultural trade. 4 issues. 1 year, \$21; 2 years, \$41; 3 years, \$60.

Situation and Outlook Reports. These reports provide timely analyses and forecasts of all major agricultural commodities and related topics such as finance, farm inputs, land values, and world and regional developments. Each *Situation and Outlook* title costs 1 year, \$12; 2 years, \$23; 3 years, \$33. Titles include:

Agricultural Income and Finance	Cotton and Wool	Oil Crops	Sugar and Sweeteners
Agricultural Resources	Dairy	Outlook for U.S.	Tobacco
Agriculture and Trade Reports	Feed	Agricultural Exports	Vegetables and Specialties
Aquaculture	Fruit and Tree Nuts	Rice	Wheat

Also available: *Livestock and Poultry*: 1 year, \$17; 2 years, \$33; 3 years, \$48.

Livestock & Poultry Update (monthly): 1 year, \$15; 2 years, \$29; 3 years, \$42.

U.S. Agricultural Trade Update (monthly): 1 year, \$15; 2 years, \$29; 3 years, \$42.

Add 25 percent for shipments to foreign addresses (includes Canada).

To subscribe to these periodicals, call our order desk toll free,
1-800-999-6779 (8:30-5:00 ET in the United States and Canada;
other areas, please call 301-725-7937), or write to:

ERS-NASS
P.O. Box 1608
Rockville, MD 20849-1608



1022384178

These periodicals bring you the latest information on food, the farm, and rural America to help you keep your expertise up-to-date. Order these periodicals today to get the latest facts, figures, trends, and issues from ERS.

Agricultural Outlook Presents USDA farm income and land price forecasts. Includes the short-term outlook, but also presents long-term analysis of issues ranging from international trade to U.S. farm use and availability. 11 issues: 1 year \$25; 2 years \$51; 3 years \$76.

Economic Indicators of the Farm Sector Updates economic trends in U.S. agriculture. With some emphasis on a different aspect of income and expenses, national and state livestock, crop, and poultry production and efficiency statistics, and costs of production for livestock and dairy and for major field crops. 3 issues: 1 year \$14; 2 years \$27; 3 years \$39.

Farmland Conversion Fact-filled articles focus on economic and policy issues, how the agricultural environment is changing, and the causes and consequences of land conversion. Includes rural development, 11 issues: 1 year \$14; 2 years \$27; 3 years \$39.

Food Review Offers the latest developments in food prices, product safety, quality, nutrition, consumption patterns, and marketing. 4 issues: 1 year \$11; 2 years \$21; 3 years \$31.

Foreign Agricultural Trade to the United States Updates the quantity and value of U.S. farm exports and imports plus price trends. 8 issues: 1 year \$25; 2 years \$49; 3 years \$73.

Rural Development Perspectives Chap. nonfictional analysis of rural development issues and what those results mean. 3 issues: 1 year \$8; 2 years \$15; 3 years \$21.

Rural Conditions and Trends Tracks rural events: macroeconomic conditions, energy, and infrastructure, rural structure, earnings and income, poverty and health. 4 issues: 1 year \$11; 2 years \$22; 3 years \$33.

The Journal of Agricultural Economics Research Technical research in agricultural economics, including economic models and statistics focusing on methods employed and results of USDA economic research. 4 issues: 1 year \$6; 2 years \$10; 3 years \$14.

World Agriculture Deals with worldwide developments in agriculture and food with an emphasis on implications for global and U.S. agricultural trade. 4 issues: 1 year \$12; 2 years \$24; 3 years \$36.

Statistics and Outlook These reports provide timely analysis and forecasts of the major agricultural commodities and related topics such as finance, farm income, exports, and regional developments. Each Statistics and Outlook title costs: 1 year \$15; 2 years \$29; 3 years \$43.

Agriculture, Regions and Finance	1 year \$15; 2 years \$29; 3 years \$43
Agricultural Research	1 year \$15; 2 years \$29; 3 years \$43
Agriculture and Trade Reports	1 year \$15; 2 years \$29; 3 years \$43
Food	1 year \$15; 2 years \$29; 3 years \$43
Fruit and Tree Nuts	1 year \$15; 2 years \$29; 3 years \$43
Grains and Oilseeds	1 year \$15; 2 years \$29; 3 years \$43
Vegetables and Spices	1 year \$15; 2 years \$29; 3 years \$43
Wool	1 year \$15; 2 years \$29; 3 years \$43

Also available: **Library and Policy** 1 year \$15; 2 years \$29; 3 years \$43.
Library and Policy 1 year \$15; 2 years \$29; 3 years \$43.
U.S. Agricultural Trade Policy 1 year \$15; 2 years \$29; 3 years \$43.

Add 25 percent for shipping to foreign destinations (surface mail).

To subscribe to these periodicals, call our order desk toll free: 1-800-852-8779 or 202-720-6700 in the United States and Canada.

UNITED STATES DEPARTMENT OF AGRICULTURE
 ECONOMIC RESEARCH SERVICE
 1301 NEW YORK AVENUE, NW.
 WASHINGTON, DC 20005-4788

Rockville, MD 20849-1608